



# **STIC Search Report**

**EIC 1700**

**STIC Database Tracking Number: 104223**

**TO: Lynette T Umez-Eronini**  
**Location: CP3 10E12**  
**Art Unit : 1765**  
**September 25, 2003**

**Case Serial Number: 09/891730**

**From: John Calve**  
**Location: EIC 1700**  
**CP3/4-3D62**  
**Phone: 308-4139**

**John.Calve@uspto.gov**

## **Search Notes**

Access DB# 104223**SEARCH REQUEST FORM**

Scientific and Technical Information Center

Requester's Full Name: Penelope Uyen-Zooi Examiner #: 14987 Date: 9/22/03  
Art Unit: 1765 Phone Number: 6-3674 Serial Number: 04891530  
Mail Box and Bldg/Room Location: CBS 10312 Results Format Preferred (circle): PAPER DISK E-MAIL

**If more than one search is submitted, please prioritize searches in order of need.**

\*\*\*\*\*

Please provide a detailed statement of the search topic, and describe as specifically as possible the subject matter to be searched. Include the elected species or structures, keywords, synonyms, acronyms, and registry numbers; and combine with the concept or utility of the invention. Define any terms that may have a special meaning. Give examples or relevant citations, authors, etc, if known. Please attach a copy of the cover sheet, pertinent claims, and abstract.

Title of Invention: \_\_\_\_\_

Inventors (please provide full names): \_\_\_\_\_

Earliest Priority Filing Date: \_\_\_\_\_

*\*For Sequence Searches Only\* Please include all pertinent information (parent, child, divisional, or issued patent numbers) along with the appropriate serial number.*

**STAFF USE ONLY****Type of Search****Vendors and cost where applicable**

Searcher: <u>JC</u>	NA Sequence (#) _____	STN <u>4p</u>
Searcher Phone #: _____	AA Sequence (#) _____	Dialog _____
Searcher Location: <u>9/24/03</u>	Structure (#) _____	Questel/Orbit <u>V</u>
Date Searcher Picked Up: <u>9/24/03</u>	Bibliographic <u>/</u>	Dr.Link _____
Date Completed: <u>9/24/03</u>	Litigation _____	Lexis/Nexis _____
Searcher Prep & Review Time: <u>120</u>	Fulltext _____	Sequence Systems _____
Clerical Prep Time: _____	Patent Family _____	WWW/Internet _____
Online Time: <u>120</u>	Other _____	Other (specify) _____



# STIC Search Results Feedback Form

**EIC17000**

Questions about the scope or the results of the search? Contact *the EIC searcher* or contact:

Kathleen Fuller, EIC 1700 Team Leader  
308-4290, CP3/4-3D62

## Voluntary Results Feedback Form

➤ I am an examiner in Workgroup:  Example: 1713

➤ Relevant prior art **found**, search results used as follows:

- ☐ 102 rejection
- ☐ 103 rejection
- ☐ Cited as being of interest.
- ☐ Helped examiner better understand the invention.
- ☐ Helped examiner better understand the state of the art in their technology.

Types of relevant prior art found:

- ☐ Foreign Patent(s)
- ☐ Non-Patent Literature  
(journal articles, conference proceedings, new product announcements etc.)

➤ Relevant prior art **not found**:

- ☐ Results verified the lack of relevant prior art (helped determine patentability).
- ☐ Results were not useful in determining patentability or understanding the invention.

Comments:

Drop off or send completed forms to STIC/EIC1700 CP3/4 3D62



=> file hca

FILE 'HCA' ENTERED AT 15:17:28 ON 24 SEP 2003  
USE IS SUBJECT TO THE TERMS OF YOUR STN CUSTOMER AGREEMENT.  
PLEASE SEE "HELP USAGETERMS" FOR DETAILS.  
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FILE COVERS 1907 - 18 Sep 2003 VOL 139 ISS 13  
FILE LAST UPDATED: 18 Sep 2003 (20030918/ED)

This file contains CAS Registry Numbers for easy and accurate substance identification.

=> d his

(FILE 'HOME' ENTERED AT 14:48:20 ON 24 SEP 2003)

FILE 'HCA' ENTERED AT 14:49:46 ON 24 SEP 2003  
E US20020102852/PN

L1           1 S E3  
             SEL L1 RN  
             S L\*\*\* AND 7732-18-5/REG#

FILE 'REGISTRY' ENTERED AT 14:50:16 ON 24 SEP 2003

FILE 'HCA' ENTERED AT 14:50:16 ON 24 SEP 2003

FILE 'REGISTRY' ENTERED AT 14:50:47 ON 24 SEP 2003

L2           19 S E1-E19  
L3           ' 1 S L2 AND 1336-21-6  
L4           1 S L2 AND 7722-84-1  
L5           1 S L2 AND 7732-18-5

FILE 'HCA' ENTERED AT 14:52:14 ON 24 SEP 2003

L6           16820 S L3 OR AMMONIUM#(N)HYDROXIDE#  
L7           77407 S L4  
L8           309980 S L5

FILE 'HCA' ENTERED AT 14:53:30 ON 24 SEP 2003

FILE 'LCA' ENTERED AT 14:53:33 ON 24 SEP 2003

L9           197 S AMMONIUM#(N)HYDROXIDE# OR NH4(W)OH OR NH4OH  
L10          198 S (AMMONIUM# OR NH4)(N)HYDROXIDE# OR NH4(W)OH OR NH4OH  
L11          376 S HYDROGEN#(N)PEROXIDE# OR H2O2

L12 7537 S WATER# OR H2O  
L13 1000 S SURFACT? OR BIOSURFACT? OR HYDROTROP? OR DETERG? OR ABSTERG?  
L14 1358 S CLEAN? OR DETERS? OR ABSTERS? OR EDULCORAT? OR DECONTAMINA? O

FILE 'HCA' ENTERED AT 14:58:12 ON 24 SEP 2003

L15 16820 S L6  
L16 13167 S L3  
L17 81521 S L10 OR L16  
L18 166099 S L7 OR L11  
L19 2764755 S L12 OR L8  
L20 5450 S L17 AND L18  
L21 3318 S L20 AND L19  
L22 348318 S L13  
L23 493124 S L14  
L24 481 S L21 AND L14  
L25 38 S L24 AND L22

FILE 'LCA' ENTERED AT 15:02:28 ON 24 SEP 2003

L26 2633 S SEMI(W)CONDUCT? OR WAFER? OR DEVICE? OR SUBSTRATE? OR VLSI OR  
L27 0 S L25 AND L26

FILE 'HCA' ENTERED AT 15:04:04 ON 24 SEP 2003

L28 22 S L25 AND L26

FILE 'LCA' ENTERED AT 15:04:55 ON 24 SEP 2003

L29 2604 S SULFATE? OR ETHER?  
L30 3238 S ?ETHYLENE?

FILE 'HCA' ENTERED AT 15:08:40 ON 24 SEP 2003

L31 9 S L25 AND L30  
L32 8 S L25 AND L29  
L33 12 S L31 OR L32  
L34 34 S L25 AND 1907-2000/PY,PRY \*\*\*\* Date limited results\*\*\*\*\*  
L35 9 S L33 AND L34  
L36 15 S L28 NOT L33  
L37 14 S L36 AND L34  
L38 11 S L34 NOT (L35 OR L36 OR L37)  
L39 3 S L33 NOT L35  
L40 15 S L36 NOT L35  
L41 11 S L34 NOT (L35 OR L36)

=> d his nofile L42-

(FILE 'JAPIO, WPIX' ENTERED AT 15:19:54 ON 24 SEP 2003)

L42 9548 SEA ABB=ON PLU=ON L9  
L43 36138 SEA ABB=ON PLU=ON L11  
L44 1753336 SEA ABB=ON PLU=ON L12  
SET MSTEPS ON  
L45 62332 SEA ABB=ON PLU=ON SURFACT? OR BIOSURFACT? OR HYDROTROP? OR  
DETERG? OR ABSTERG? OR (SURFACE(W)ACTIVE# OR WETTING# OR  
FOAMING#) (A) (AGENT? OR ADDITIVE? OR COMPOUND? OR COMPD# OR  
CMPD#) OR EMULSIFIER? OR DISPERSANT?  
L46 180908 SEA ABB=ON PLU=ON SURFACT? OR BIOSURFACT? OR HYDROTROP? OR  
DETERG? OR ABSTERG? OR (SURFACE(W)ACTIVE# OR WETTING# OR  
FOAMING#) (A) (AGENT? OR ADDITIVE? OR COMPOUND? OR COMPD# OR  
CMPD#) OR EMULSIFIER? OR DISPERSANT?

TOTAL FOR ALL FILES

L47 243240 SEA ABB=ON PLU=ON L13  
L48 150090 SEA ABB=ON PLU=ON CLEAN? OR DETERS? OR ABSTERS? OR EDULCORAT?  
OR DECONTAMINA? OR ABLUT? OR ELUTION# OR ELUTRIAT? OR SCRUB?

OR SCOUR? OR DEGREAS?  
L49 346351 SEA ABB=ON PLU=ON CLEAN? OR DETERS? OR ABSTERS? OR EDULCORAT?  
OR DECONTAMINA? OR ABLUT? OR ELUTION# OR ELUTRIAT? OR SCRUB?  
OR SCOUR? OR DEGREAS?

## TOTAL FOR ALL FILES

L50 496441 SEA ABB=ON PLU=ON L14  
L51 38 SEA ABB=ON PLU=ON L42 AND L43 AND L44  
L52 441 SEA ABB=ON PLU=ON L42 AND L43 AND L44

## TOTAL FOR ALL FILES

L53 479 SEA ABB=ON PLU=ON L42 AND L43 AND L44  
SET MSTEPS OFF  
L54 479 SEA ABB=ON PLU=ON L51 AND (L47 OR L53)  
SET MSTEPS ON

L55 38 SEA ABB=ON PLU=ON L51 AND (L45 OR L51)  
L56 441 SEA ABB=ON PLU=ON L51 AND (L46 OR L52)

## TOTAL FOR ALL FILES

L57 479 SEA ABB=ON PLU=ON L51 AND (L47 OR L53)  
L58 20 SEA ABB=ON PLU=ON L51 AND L48  
L59 160 SEA ABB=ON PLU=ON L52 AND L49

## TOTAL FOR ALL FILES

L60 180 SEA ABB=ON PLU=ON L53 AND L50

FILE 'WPIX' ENTERED AT 15:24:53 ON 24 SEP 2003

E US20020102852/PN

L61 1 SEA ABB=ON PLU=ON US20020102852/PN  
D SCAN  
D L61 MC

FILE 'STNGUIDE' ENTERED AT 15:25:47 ON 24 SEP 2003

FILE 'WPIX' ENTERED AT 15:27:54 ON 24 SEP 2003

L62 38735 SEA ABB=ON PLU=ON D11?/MC  
L63 198397 SEA ABB=ON PLU=ON L04-C?/MC  
L64 322217 SEA ABB=ON PLU=ON U11-C?/MC  
L65 16 SEA ABB=ON PLU=ON L59 AND L13  
L66 160 SEA ABB=ON PLU=ON L59 AND L14  
L67 6 SEA ABB=ON PLU=ON L66 AND L62  
L68 4 SEA ABB=ON PLU=ON L67 AND (L26 OR IC OR INTEGRAT?(A)CIRCUIT?)

L69 2945741 SEA ABB=ON PLU=ON (L26 OR IC OR INTEGRAT?(A)CIRCUIT?)  
L70 135 SEA ABB=ON PLU=ON L66 AND L69  
L71 12 SEA ABB=ON PLU=ON L65 AND L70  
L72 9 SEA ABB=ON PLU=ON L71 NOT L68

FILE 'JAPIO' ENTERED AT 15:34:44 ON 24 SEP 2003

L73 2745476 SEA ABB=ON PLU=ON (L26 OR IC OR INTEGRAT?(A)CIRCUIT?)  
L74 20 SEA ABB=ON PLU=ON L55 AND L14  
L75 0 SEA ABB=ON PLU=ON L74 AND L13  
L76 1 SEA ABB=ON PLU=ON L55 AND L13  
L77 16 SEA ABB=ON PLU=ON L74 AND L73

FILE 'STNGUIDE' ENTERED AT 15:37:05 ON 24 SEP 2003

FILE 'JAPIO' ENTERED AT 15:40:29 ON 24 SEP 2003

L78 17 SEA ABB=ON PLU=ON L77 OR L76  
D SCAN  
L79 2411529 SEA ABB=ON PLU=ON SOLUTION# OR SOLN#  
L80 16 SEA ABB=ON PLU=ON L78 AND L79  
SET MSTEPS ON

FILE 'HCA, WPIX, JAPIO' ENTERED AT 15:46:15 ON 24 SEP 2003  
L81 66 DUP REM L25 L65 L71 L80 (16 DUPLICATES REMOVED)  
L82 38 SEA L81  
L83 28 SEA ABB=ON PLU=ON L82 AND L80  
L84 12 SEA L81  
L85 16 SEA L81

FILE 'JAPIO' ENTERED AT 15:47:46 ON 24 SEP 2003  
SET MSTEPS OFF  
L86 16 SEA L81  
L87 15 SEA ABB=ON PLU=ON L77 AND L86

FILE 'WPIX' ENTERED AT 15:49:08 ON 24 SEP 2003  
L88 12 SEA L81  
L89 8 SEA ABB=ON PLU=ON (L72 OR L68) AND L88

=> d L35 1-9 ibib abs hitind hitrn

L35 ANSWER 1 OF 9 HCA COPYRIGHT 2003 ACS on STN  
ACCESSION NUMBER: 137:40135 HCA  
TITLE: Stabilized alkaline solutions for **cleaning**  
of semiconductor substrates for microelectronic  
applications  
INVENTOR(S): Skee, David C.  
PATENT ASSIGNEE(S): USA  
SOURCE: U.S. Pat. Appl. Publ., 27 pp., Cont.-in-part of U.S.  
Ser. No. 688,559.  
CODEN: USXXCO  
DOCUMENT TYPE: Patent  
LANGUAGE: English  
FAMILY ACC. NUM. COUNT: 4  
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 2002077259	A1	20020620	US 2001-859142	20010516 <--
US 6599370	B2	20030729		
US 6585825	B1	20030701	US 2000-688559	20001016 <--
WO 2002033033	A1	20020425	WO 2001-US42406	20010928 <--
W:	AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM			
RW:	GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG			
AU 2001096947	A5	20020429	AU 2001-96947	20010928 <--
EP 1326951	A1	20030716	EP 2001-977863	20010928 <--
R:	AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR			
PRIORITY APPLN. INFO.:			US 2000-688559	A2 20001016 <--
			US 1998-85861P	P 19980518 <--
			US 1999-115084P	P 19990107 <--
			WO 1999-US10875	A2 19990517 <--
			US 2001-859142	A 20010516
			WO 2001-US42406	W 20010928

- AB This invention relates to compns. useful in the microelectronics industry for **cleaning** semiconductor wafer substrates. Particularly, this invention relates to alk. stripping or **cleaning** compns. contg. bath stabilizing agents that are used for **cleaning** wafers having metal lines and vias by removing metallic and org. contamination without damaging the integrated circuits. The invention provides aq. alk. compns. useful in the microelectronics industry for stripping or **cleaning** semiconductor wafer substrates by removing photoresist residues and other unwanted contaminants. The compns. typically contain (a) one or more metal ion-free bases at sufficient amts. to produce a pH of .apprx.10-13 and .gtoreq.1 bath stabilizing agents having at least one pKa at 10-13 to maintain this pH during use; (b) optionally, .apprx.0.01% to .apprx.5% by wt. (expressed as % SiO<sub>2</sub>) of a H<sub>2</sub>O-sol. metal ion-free silicate; (c) optionally, .apprx.0.01% to .apprx.10% by wt. of .gtoreq.1 chelating agents; (d) optionally, .apprx.0.01% to .apprx.80% by wt. of .gtoreq.1 H<sub>2</sub>O-sol. org. cosolvents; and (e) optionally, .apprx.0.01% to .apprx.1% by wt. of a H<sub>2</sub>O-sol. **surfactant**.
- IC ICM B08B007-00  
ICS B08B003-00; C23G001-00; C23G001-02; C03C023-00; F23J001-00;  
B08B003-10; B08B003-14
- NCL 510175000
- CC 76-2 (Electric Phenomena)  
Section cross-reference(s): 48
- ST semiconductor material alk **cleaning** soln
- IT Silicates, processes  
RL: NUU (Other use, unclassified); PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process); USES (Uses)  
(bath stabilizing agent; stabilized alk. solns. for **cleaning** of semiconductor substrates for microelectronic applications)
- IT Amino acids, processes  
RL: NUU (Other use, unclassified); PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process); USES (Uses)  
(chelating agent; stabilized alk. solns. for **cleaning** of semiconductor substrates for microelectronic applications)
- IT Alcohols, processes  
RL: NUU (Other use, unclassified); PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process); USES (Uses)  
(cosolvent; stabilized alk. solns. for **cleaning** of semiconductor substrates for microelectronic applications)
- IT Photoresists  
(residue removal; stabilized alk. solns. for **cleaning** of semiconductor substrates for microelectronic applications)
- IT Amines, processes  
Quaternary ammonium compounds, processes  
RL: NUU (Other use, unclassified); PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process); USES (Uses)  
(semiconductor **cleaning** soln. alk. component; stabilized alk. solns. for **cleaning** of semiconductor substrates for microelectronic applications)
- IT Chelating agents  
**Cleaning**  
Interconnections, electric  
Semiconductor materials  
Stabilizing agents  
**Surfactants**  
(stabilized alk. solns. for **cleaning** of semiconductor substrates for microelectronic applications)
- IT Bases, processes  
RL: NUU (Other use, unclassified); PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process); USES (Uses)



- (stabilized alk. solns. for **cleaning** of semiconductor substrates for microelectronic applications)
- IT 107-15-3, 1,2-Ethanediamine, processes 109-76-2, 1,3-Propanediamine 110-60-1, 1,4-Butanediamine 124-09-4, 1,6-Hexanediamine, processes 373-44-4, 1,8-Octanediamine 589-37-7, 1,3-Diaminopentane 2783-17-7, 1,12-Dodecanediamine 15520-10-2, 2-Methyl-1,5-pentanediamine  
RL: NUU (Other use, unclassified); PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process); USES (Uses)  
(bath stabilizing agent, semiconductor **cleaning** soln. alk. component; stabilized alk. solns. for **cleaning** of semiconductor substrates for microelectronic applications)
- IT 69-72-7, Salicylic acid, processes 94-67-7, Salicylaldehyde 97-05-2, 5-Sulfosalicylic acid 108-46-3, Resorcinol, processes 127-06-0, Acetone oxime 142-08-5, 2-Hydroxypyridine 504-15-4, Orcinol 608-25-3, 2-Methylresorcinol 626-64-2, 4-Hydroxypyridine 7664-38-2, Phosphoric acid, processes 7722-84-1, **Hydrogen peroxide**, processes  
RL: NUU (Other use, unclassified); PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process); USES (Uses)  
(bath stabilizing agent; stabilized alk. solns. for **cleaning** of semiconductor substrates for microelectronic applications)
- IT 60-00-4, (**Ethylenedinitrilo**)tetraacetic acid, processes 67-43-6, **Diethylenetriaminepentaacetic** acid 482-54-2, (1,2-Cyclohexylenedinitrilo)tetraacetic acid 869-52-3, **Triethylenetetraminehexaacetic** acid 1429-50-1 2809-21-4 3148-72-9, 1,3-Diamino-2-hydroxypropane-N,N,N',N'-tetraacetic acid 6419-19-8, Nitrilotris(**methylene**)triphosphonic acid 13291-61-7, trans-(1,2-Cyclohexylenedinitrilo)tetraacetic acid 13598-36-2D, Phosphonic acid, derivs. 15827-60-8, **Diethylenetriaminepenta(methylenephosphonic acid)** 34690-00-1 37971-36-1, 2-Phosphonobutane-1,2,4-tricarboxylic acid 83834-39-3 91987-74-5 92761-25-6 122114-60-7  
RL: NUU (Other use, unclassified); PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process); USES (Uses)  
(chelating agent; stabilized alk. solns. for **cleaning** of semiconductor substrates for microelectronic applications)
- IT 7429-90-5, Aluminum, processes 11099-19-7  
RL: PEP (Physical, engineering or chemical process); PYP (Physical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)  
(**cleaning** of; stabilized alk. solns. for **cleaning** of semiconductor substrates for microelectronic applications)
- IT 56-81-5, Glycerol, processes 52928-63-9D, 1-Hydroxy-2-pyrrolidinone, alkyl derivs.  
RL: NUU (Other use, unclassified); PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process); USES (Uses)  
(cosolvent; stabilized alk. solns. for **cleaning** of semiconductor substrates for microelectronic applications)
- IT 62-49-7, Choline 75-59-2, Tetramethylammonium hydroxide 77-98-5, Tetraethylammonium hydroxide 462-94-2, 1,5-Pentanediamine 631-41-4, Tetraethanolammonium hydroxide 646-19-5, 1,7-Heptanediamine 646-24-2, 1,9-Nonanediamine 646-25-3, 1,10-Decanediamine 822-08-2, 1,11-Undecanediamine 1336-21-6D, **Ammonium hydroxide**, derivs. 2052-49-5, Tetrabutylammonium hydroxide 4499-86-9, Tetrapropylammonium hydroxide 12794-95-5D, Ammonium silicate, derivs. 33667-48-0, Monomethyltriethanolammonium hydroxide 53116-81-7, Tetramethyl ammonium silicate 109334-81-8, Methyltriethylammonium hydroxide  
RL: NUU (Other use, unclassified); PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process); USES (Uses)

(semiconductor **cleaning** soln. alk. component; stabilized alk. solns. for **cleaning** of semiconductor substrates for microelectronic applications)

IT 9014-85-1, Surfynol 465  
RL: NUU (Other use, unclassified); PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process); USES (Uses)  
(**surfactant**; stabilized alk. solns. for **cleaning** of semiconductor substrates for microelectronic applications)

IT 7722-84-1, Hydrogen peroxide, processes  
RL: NUU (Other use, unclassified); PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process); USES (Uses)  
(bath stabilizing agent; stabilized alk. solns. for **cleaning** of semiconductor substrates for microelectronic applications)

IT 1336-21-6D, Ammonium hydroxide, derivs.  
RL: NUU (Other use, unclassified); PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process); USES (Uses)  
(semiconductor **cleaning** soln. alk. component; stabilized alk. solns. for **cleaning** of semiconductor substrates for microelectronic applications)

L35 ANSWER 2 OF 9 HCA COPYRIGHT 2003 ACS on STN

ACCESSION NUMBER: 136:91434 HCA

TITLE: **Cleaning** method and solution for **cleaning** a wafer in a single wafer process

INVENTOR(S): Verhaverbeke, Steven; Truman, J. Kelly

PATENT ASSIGNEE(S): Applied Materials, Inc., USA

SOURCE: PCT Int. Appl., 58 pp.

CODEN: PIXXD2

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2002001609	A2	20020103	WO 2001-US41160	20010626 <--
W: CN, JP, KR				
RW: AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR				
US 2002102852	A1	20020801	US 2001-891730	20010625 <--
PRIORITY APPLN. INFO.:			US 2000-214116P	P 20000626 <--
			US 2001-891730	A 20010625

AB The present invention is a novel **cleaning** method and a soln. for use in a single wafer **cleaning** process. According to the present invention the **cleaning** soln. comprises **NH4OH**, **H2O2**, **H2O** and a chelating agent. In an embodiment of the present invention the **cleaning** soln. also contains a **surfactant**. And still yet another embodiment of the present invention the **cleaning** soln. also comprises a dissolved gas such as **H2**. In a particular embodiment of the present invention, this soln. is used by spraying or dispensing it on a spinning wafer.

IC ICM H01L

CC 66-6 (Surface Chemistry and Colloids)

Section cross-reference(s): 76

ST wafer **cleaning** soln single process

IT Chelating agents

**Surfactants**

(**NH4OH/H2O2/H2O**/chelating agent/

**surfactant**; **cleaning** method and soln. for

**cleaning** a wafer in a single wafer process)

- IT Carboxylic acids, processes  
RL: NUU (Other use, unclassified); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)  
(chelating agent; **cleaning** method and soln. for **cleaning** a wafer in a single wafer process)
- IT Vapor deposition process  
(chem.; **cleaning** method and soln. for **cleaning** a wafer in a single wafer process)
- IT Annealing  
Cavitation  
Degassing  
Oxidation  
Spraying  
Ultrasonic **cleaning**  
(**cleaning** method and soln. for **cleaning** a wafer in a single wafer process)
- IT **Cleaning**  
(megasonic; **cleaning** method and soln. for **cleaning** a wafer in a single wafer process)
- IT Ashing  
(oxygen; **cleaning** method and soln. for **cleaning** a wafer in a single wafer process)
- IT Semiconductor materials  
(wafer; **cleaning** method and soln. for **cleaning** a wafer in a single wafer process)
- IT 1336-21-6, Ammonium hydroxide ((NH<sub>4</sub>)(OH)) 7722-84-1, Hydrogen peroxide, processes 7732-18-5, Water, processes  
RL: NUU (Other use, unclassified); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)  
(NH<sub>4</sub>OH/H<sub>2</sub>O<sub>2</sub>/H<sub>2</sub>O/chelating agent/surfactant; **cleaning** method and soln. for **cleaning** a wafer in a single wafer process)
- IT 7782-44-7, Oxygen, processes 10028-15-6, Ozone, processes  
RL: NUU (Other use, unclassified); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)  
(cavitation gases, oxidant in rinse soln.; **cleaning** method and soln. for **cleaning** a wafer in a single wafer process)
- IT 7440-37-1, Argon, processes 7440-59-7, Helium, processes 7727-37-9, Nitrogen, processes  
RL: NUU (Other use, unclassified); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)  
(cavitation gases; **cleaning** method and soln. for **cleaning** a wafer in a single wafer process)
- IT 60-00-4, Ethylenediaminetetraacetic acid, processes  
RL: NUU (Other use, unclassified); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)  
(chelating agent; **cleaning** method and soln. for **cleaning** a wafer in a single wafer process)
- IT 70-51-9, Desferrioxamine B 869-52-3, TTHA 7782-91-4, Molybdic acid 26636-37-3 35998-29-9 256326-70-2 385765-20-8, MCX-SD 2000  
RL: NUU (Other use, unclassified); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)  
(**cleaning** method and soln. for **cleaning** a wafer in a single wafer process)
- IT 1333-74-0, Hydrogen, processes  
RL: NUU (Other use, unclassified); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)  
(dissolved gas, cavitation gas; **cleaning** method and soln. for **cleaning** a wafer in a single wafer process)

IT 7664-39-3, Hydrogen fluoride, processes  
RL: NUU (Other use, unclassified); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)  
(etching soln.; **cleaning** method and soln. for **cleaning** a wafer in a single wafer process)

IT 124-38-9, Carbon dioxide, processes  
RL: NUU (Other use, unclassified); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)  
(to dissipate static electricity in rinse soln.; **cleaning** method and soln. for **cleaning** a wafer in a single wafer process)

IT 1336-21-6, Ammonium hydroxide ((NH<sub>4</sub>)(OH)) 7722-84-1, Hydrogen peroxide, processes 7732-18-5, Water, processes  
RL: NUU (Other use, unclassified); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)  
(NH<sub>4</sub>OH/H<sub>2</sub>O<sub>2</sub>/H<sub>2</sub>O/chelating agent/**surfactant**; **cleaning** method and soln. for **cleaning** a wafer in a single wafer process)

L35 ANSWER 3 OF 9 HCA COPYRIGHT 2003 ACS on STN  
ACCESSION NUMBER: 133:47594 HCA  
TITLE: Wet **cleaning** of silicon carbide ceramics  
INVENTOR(S): Otsuki, Masami; Wada, Hiroaki  
PATENT ASSIGNEE(S): Bridgestone Corp., Japan  
SOURCE: Jpn. Kokai Tokkyo Koho, 6 pp.  
CODEN: JKXXAF  
DOCUMENT TYPE: Patent  
LANGUAGE: Japanese  
FAMILY ACC. NUM. COUNT: 2  
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2000169233	A2	20000620	JP 1998-348701	19981208 <--
US 2002005213	A1	20020117	US 1999-449764	19991126 <--

PRIORITY APPLN. INFO.: JP 1998-348700 A 19981208 <--  
JP 1998-348701 A 19981208 <--

AB SiC ceramics are immersed in a semiaq. org. solvent, an aq. ammonium soln., an inorg. acid aq. soln., and then pure **water**. The treatment with the aq. ammonium soln. may be skipped, or the order of the treatment with aq. ammonium soln. and the inorg. acid aq. soln. may be reversed. Impurities in the surface and close to the surface of the SiC ceramics can be easily removed in high efficiency.

IC ICM C04B035-565  
ICS H01L021-304

CC 57-2 (Ceramics)

ST **cleaning** wet silicon carbide ceramic impurity removal

IT Petroleum hydrocarbons  
RL: NUU (Other use, unclassified); USES (Uses)  
(**cleaning** with; wet **cleaning** of SiC ceramics for removal of impurities in surface region)

IT Glycols, uses  
Glycols, uses  
RL: NUU (Other use, unclassified); USES (Uses)  
(**ethers**, **cleaning** with; wet **cleaning** of SiC ceramics for removal of impurities in surface region)

IT **Ethers**, uses  
**Ethers**, uses  
RL: NUU (Other use, unclassified); USES (Uses)

- (glycol, **cleaning** with; wet **cleaning** of SiC ceramics for removal of impurities in surface region)
- IT **Surfactants**  
(nonionic, **cleaning** with; wet **cleaning** of SiC ceramics for removal of impurities in surface region)
- IT Acids, uses  
RL: NUU (Other use, unclassified); USES (Uses)  
(org., esters, **cleaning** with; wet **cleaning** of SiC ceramics for removal of impurities in surface region)
- IT Quaternary ammonium compounds, uses  
RL: NUU (Other use, unclassified); USES (Uses)  
(tetraalkyl, halides, **cleaning** with; wet **cleaning** of SiC ceramics for removal of impurities in surface region)
- IT Ceramics  
**Cleaning**  
(wet **cleaning** of SiC ceramics for removal of impurities in surface region)
- IT **1336-21-6, Ammonium hydroxide** 7647-01-0,  
Hydrochloric acid, uses 7664-39-3, Hydrofluoric acid, uses 7664-93-9,  
Sulfuric acid, uses 7697-37-2, Nitric acid, uses **7722-84-1**,  
**Hydrogen peroxide**, uses **7732-18-5**,  
**Water**, uses 7790-98-9D, Ammonium perchlorate, tetraalkyl  
10028-15-6, Ozone, uses  
RL: NUU (Other use, unclassified); USES (Uses)  
(**cleaning** with; wet **cleaning** of SiC ceramics for removal of impurities in surface region)
- IT 7429-90-5, Aluminum, processes 7439-89-6, Iron, processes 7440-02-0,  
Nickel, processes 7440-09-7, Potassium, processes 7440-23-5, Sodium,  
processes 7440-42-8, Boron, processes 7440-47-3, Chromium, processes  
7440-50-8, Copper, processes 7440-66-6, Zinc, processes 7440-70-2,  
Calcium, processes  
RL: REM (Removal or disposal); PROC (Process)  
(impurity; wet **cleaning** of SiC ceramics for removal of impurities in surface region)
- IT 409-21-2, Silicon carbide (SiC), processes  
RL: PEP (Physical, engineering or chemical process); PROC (Process)  
(wet **cleaning** of SiC ceramics for removal of impurities in surface region)
- IT **1336-21-6, Ammonium hydroxide**  
**7722-84-1, Hydrogen peroxide**, uses  
**7732-18-5, Water**, uses  
RL: NUU (Other use, unclassified); USES (Uses)  
(**cleaning** with; wet **cleaning** of SiC ceramics for removal of impurities in surface region)

L35 ANSWER 4 OF 9 HCA COPYRIGHT 2003 ACS on STN  
ACCESSION NUMBER: 126:200940 HCA  
TITLE: Method and compositions for **cleaning** surface  
of substrate  
INVENTOR(S): Morinaga, Hitoshi; Fujisue, Masaya  
PATENT ASSIGNEE(S): Mitsubishi Chemical Corporation, Japan; Morinaga,  
Hitoshi; Fujisue, Masaya  
SOURCE: PCT Int. Appl., 60 pp.  
CODEN: PIXXD2  
DOCUMENT TYPE: Patent  
LANGUAGE: Japanese  
FAMILY ACC. NUM. COUNT: 2  
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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WO 9705228	A1	19970213	WO 1996-JP2077	19960725	<--
W: KR, US					
RW: AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE					
JP 09040997	A2	19970210	JP 1995-191504	19950727	<--
JP 3198878	B2	20010813			
JP 09067688	A2	19970311	JP 1995-243859	19950830	<--
JP 09082676	A2	19970328	JP 1995-257237	19950911	<--
JP 09082677	A2	19970328	JP 1995-257238	19950911	<--
JP 09100494	A2	19970415	JP 1995-279913	19951004	<--
JP 09241612	A2	19970916	JP 1996-56087	19960313	<--
JP 3303655	B2	20020722			
EP 789071	A1	19970813	EP 1996-925074	19960725	<--
R: DE, FR, GB					
TW 401604	B	20000811	TW 1996-85109284	19960730	<--
JP 09111224	A2	19970428	JP 1996-229441	19960813	<--
JP 09157692	A2	19970617	JP 1996-281290	19961003	<--
US 5885362	A	19990323	US 1997-809147	19970514	<--
US 6228823	B1	20010508	US 1998-218000	19981222	<--
US 2002045556	A1	20020418	US 2000-749545	20001228	<--
US 6498132	B2	20021224			

PRIORITY APPLN. INFO.:

JP 1995-191504	A	19950727	<--
JP 1995-230700	A	19950817	<--
JP 1995-243859	A	19950830	<--
JP 1995-257237	A	19950911	<--
JP 1995-257238	A	19950911	<--
JP 1995-279912	A	19951004	<--
JP 1995-279913	A	19951004	<--
JP 1996-56087	A	19960313	<--
WO 1996-JP2077	W	19960725	<--
US 1997-809147	A3	19970514	<--
US 1998-218000	A3	19981222	<--

OTHER SOURCE(S): MARPAT 126:200940

AB The title compns. esp. useful for **cleaning** electronic or semiconductor devices comprise a liq. medium contg. a complexing agent as a preventer for metal deposition, where the complexing agent comprise (A) complexing agents having arom. ring bearing OH or/and O- group, and/or (B) complexing agents having a N, halogen, S or/and O donor atom in the mol. or carboxylic acid groups, hydroxy mono- or dicarboxylic acid complexing agents having .ltoreq.4 OH groups and complexing agents having a carbonyl group. Thus, a **cleaning** compn. comprised a medium made up from a 30% aq. NH3, 31% H2O2 and water at vol. ratio of 0.25:1:5, and 0.01% EDDHA, and contained only 10 ppb each of Al and Fe chloride as impurities for good **cleaning** performance.

IC ICM C11D007-04

ICS C11D007-26; H01L021-304; C23F001-32; B21B045-02

CC 46-6 (Surface Active Agents and Detergents)

Section cross-reference(s): 76

ST silicon wafer **cleaning** soln metal scavenger; chelating agent wafer **cleaning** soln; complexing agent wafer **cleaning** soln; arom chelating agent **cleaning** wafer; ammonia soln wafer **cleaning** soln; hydrogen peroxide wafer **cleaning**; EDDHA wafer **cleaning** soln

IT Chelating agents  
(**detergent** compns.; method and compns. for **cleaning** surface of substrate such as silicon wafer)

IT Polyphosphoric acids  
RL: TEM (Technical or engineered material use); USES (Uses)  
(**detergent** compns.; method and compns. for **cleaning** surface of substrate such as silicon wafer)

- IT Carboxylic acids, uses  
RL: TEM (Technical or engineered material use); USES (Uses)  
(dicarboxylic, **detergent** compns.; method and compns. for  
**cleaning** surface of substrate such as silicon wafer)
- IT **Detergents**  
Semiconductor devices  
(method and compns. for **cleaning** surface of substrate such as  
silicon wafer)
- IT Acids, uses  
RL: TEM (Technical or engineered material use); USES (Uses)  
(oxo, **detergent** compns.; method and compns. for  
**cleaning** surface of substrate such as silicon wafer)
- IT 56-40-6, Glycine, uses 60-00-4, EDTA, uses 64-19-7, Acetic acid, uses  
66-71-7, o-Phenanthroline 67-63-0, Isopropyl alcohol, uses 69-72-7,  
Salicylic acid, uses 75-05-8, Acetonitrile, uses 75-59-2, TMAH  
87-69-4, uses 95-15-8, Benzothiophene 97-05-2, Sulfosalicylic acid  
102-71-6, uses 110-85-0, **Diethylenediamine**, uses 115-41-3,  
Pyrocatechol violet 120-80-9, 1,2-Benzenediol, uses 123-54-6,  
Acetylacetone, uses 123-91-1, 1,4-Dioxane, uses 139-13-9,  
Nitrilotriacetic acid 141-82-2, Malonic acid, uses 142-73-4,  
Iminodiacetic acid 144-62-7, Ethanedioic acid, uses 148-24-3,  
8-Quinolinol, uses 149-45-1, Tiron 463-79-6, Carbonic acid, uses  
584-08-7, Potassium carbonate 1170-02-1, EDDHA **1336-21-6**,  
**Ammonium hydroxide** 1343-98-2, Silicic acid  
1571-36-4, Stilbazo 1787-61-7, Eriochrome Black T 2050-14-8,  
o,o'-Dihydroxyazobenzene 5287-25-2, Oxalic acid bis(salicylaldehyde  
hydrazide) 7601-90-3, Perchloric acid, uses 7647-01-0, Hydrochloric  
acid, uses 7664-38-2, Phosphoric acid, uses 7664-39-3, Hydrogen  
fluoride, uses 7664-93-9, Sulfuric acid, uses 7697-37-2, Nitric acid,  
uses **7722-84-1**, **Hydrogen peroxide**, uses  
7758-09-0, Potassium nitrite 7778-80-5, Potassium **sulfate**,  
uses 7782-77-6, Nitrous acid 7790-92-3, Hypochlorous acid  
10043-35-3, Boric acid (H3BO3), uses 10380-08-2, Tripolyphosphoric acid  
13898-47-0, Chlorous acid 26628-22-8, Sodium azide 35998-29-9, HBED  
RL: TEM (Technical or engineered material use); USES (Uses)  
(**detergent** compns.; method and compns. for **cleaning**  
surface of substrate such as silicon wafer)
- IT 3147-14-6, Calmagite  
RL: TEM (Technical or engineered material use); USES (Uses)  
(method and compns. for **cleaning** surface of substrate such as  
silicon wafer)
- IT **1336-21-6**, **Ammonium hydroxide**  
**7722-84-1**, **Hydrogen peroxide**, uses  
RL: TEM (Technical or engineered material use); USES (Uses)  
(**detergent** compns.; method and compns. for **cleaning**  
surface of substrate such as silicon wafer)

L35 ANSWER 5 OF 9 HCA COPYRIGHT 2003 ACS on STN  
ACCESSION NUMBER: 108:40149 HCA  
TITLE: Method of liquid **detergents** and liquid  
cosmetic agents preparation  
INVENTOR(S): Haumer, Jaroslav; Lopata, Vaclav; Novak, Vaclav;  
Rieger, Frantisek; Dittl, Pavel; Bares, Milan; Kepl,  
Jiri; Novak, Jan; Spal, Milan  
PATENT ASSIGNEE(S): Czech.  
SOURCE: Czech., 6 pp.  
CODEN: CZXXA9  
DOCUMENT TYPE: Patent  
LANGUAGE: Czech  
FAMILY ACC. NUM. COUNT: 1

## PATENT INFORMATION:

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
	-----	----	-----	-----	-----
	CS 238069	B1	19851113	CS 1982-9866	19821228 <--
PRIORITY APPLN. INFO.:				CS 1982-9866	19821228 <--
AB	Neutralization of the acid form of synthetic <b>surfactants</b> in the presence of EtOH or HOCH <sub>2</sub> CH <sub>2</sub> OH is accompanied by a decrease in viscosity and the evolution of heat which accelerate the process and permit continuous operation. Alkylbenzenesulfonic acid (380 kg) was treated simultaneously with EtOH 216.7, <b>H<sub>2</sub>O<sub>2</sub></b> soln. 2.5, and aq. <b>NH<sub>4</sub>OH</b> 140 kg/h, and the mixt. was continuously homogenized with a mixt. of Na alkyl <b>ether sulfate</b> 420, Na lauryl <b>sulfate</b> 312.5, Na sulfosuccinate 120, fatty acid diethanolamide 22.5, Na nitrilotriacetate 10, and <b>water</b> 860 kg/h to give a clear liq. <b>cleanser</b> having pH 6.				
IC	ICM C11D011-04				
CC	46-6 (Surface Active Agents and Detergents)				
ST	<b>cleaner</b> liq manuf acid neutralization; ethanol <b>cleaner</b> liq neutralization; <b>ethylene glycol cleaner</b> liq neutralization; alkylbenzenesulfonic neutralization liq <b>cleaner</b> ; ammonia neutralization alkylbenzenesulfonic <b>cleaner</b>				
IT	<b>Detergents</b> ( <b>cleaning</b> compns., liq., alkylbenzenesulfonic acid neutralization in manuf. of)				
IT	64-17-5, Ethanol, uses and miscellaneous 107-21-1, <b>Ethylene glycol</b> , uses and miscellaneous				
	RL: USES (Uses) (alkylbenzenesulfonic acid neutralization in presence of, for liq. <b>cleaner</b> )				

L35 ANSWER 6 OF 9 HCA COPYRIGHT 2003 ACS on STN  
ACCESSION NUMBER: 94:94799 HCA  
TITLE: Surface-treating agent adapted for intermediate products of a semiconductor device  
INVENTOR(S): Asano, Masafumi; Muraoka, Hisashi; Ohashi, Taizo; Shimazaki, Yuzo  
PATENT ASSIGNEE(S): Tokyo Shibaura Electric Co., Ltd., Japan  
SOURCE: U.S., 14 pp. Division of U.S. Ser. No. 718,911.  
CODEN: USXXAM  
DOCUMENT TYPE: Patent  
LANGUAGE: English  
FAMILY ACC. NUM. COUNT: 5  
PATENT INFORMATION:

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
	-----	----	-----	-----	-----
	US 4239661	A	19801216	US 1978-927139	19780721 <--
	JP 52064878	A2	19770528	JP 1975-140722	19751126 <--
	JP 56053211	B4	19811217		
	JP 52064871	A2	19770528	JP 1975-140725	19751126 <--
	JP 53020377	B4	19780626		
	JP 52064877	A2	19770528	JP 1975-140721	19751126 <--
	JP 52064870	A2	19770528	JP 1975-140724	19751126 <--
	JP 53020376	B4	19780626		
	JP 52064876	A2	19770528	JP 1975-140723	19751126 <--
	JP 53043012	B4	19781116		
	US 4339340	A	19820713	US 1980-213317	19801205 <--
PRIORITY APPLN. INFO.:				JP 1975-140721	19751126 <--
				JP 1975-140722	19751126 <--



JP 1975-140723 19751126 <--  
JP 1975-140724 19751126 <--  
JP 1975-140725 19751126 <--  
US 1976-718911 19760830 <--  
JP 1976-140726 19761126 <--  
JP 1975-140726 19751126 <--  
US 1978-927139 19780721 <--

AB An aq. soln. contg. 0.01-20 wt.% of .gtoreq.1 trialkyl(hydroxyalkyl) **ammonium hydroxide**, where the 3 alkyl groups have 1-4 C atoms and the alkyl in the hydroxyalkyl group is an alkylene group with 2-4 C atoms, is used to **clean** the surface of an intermediate product obtained in the manuf. of semiconductor devices. The aq. soln. may contain further 0.01-10 parts by wt., based on 100 parts by wt. of the aq. soln., of .gtoreq.1 complexing agent capable of forming a H2O-sol. complex with metals, e.g. NaCN, NH4CN, triethanolamine. In addn., the aq. soln. may contain a nonionic **surfactant** in an amt. of 0.001-5 parts by wt. based on 100 parts by wt. soln., in particular poly(**oxyethylene**)nonylphenyl **ether**. H2O2, 0.003-30 parts by wt. may be present based on 100 parts by wt. of aq. soln. The solns. can be used also to remove photoresist films and etch metal (e.g. Al) layers in semiconductor technol. The use of trimethyl(2-hydroxyethyl) **ammonium hydroxide** is described in detail.

IC C11D003-26; C11D003-30; C11D007-32

NCL 252541000

CC 76-13 (Electric Phenomena)

Section cross-reference(s): 74

IT Etching

(of semiconductor devices, soln. contg. trialkyl(hydroxyalkyl)

**ammonium hydroxide** for)

IT Semiconductor devices

(surface-treating agents for use in fabrication of, contg.

trialkyl(hydroxyalkyl)**ammonium hydroxide**)

IT 102-71-6, uses and miscellaneous 143-33-9 7722-84-1, uses and

miscellaneous 9016-45-9 12211-52-8

RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)

(surface-treating agent contg., in fabrication of semiconductor devices)

IT 7722-84-1, uses and miscellaneous

RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)

(surface-treating agent contg., in fabrication of semiconductor devices)

L35 ANSWER 7 OF 9 HCA COPYRIGHT 2003 ACS on STN

ACCESSION NUMBER: 76:115225 HCA

TITLE: Dry **cleaning** with **hydrogen peroxide**

INVENTOR(S): Keay, Robert E.; Castrantas, Harry M.; MacKellar, Donald G.

PATENT ASSIGNEE(S): FMC Corp.

SOURCE: U.S., 4 pp.

CODEN: USXXAM

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 3

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
-----	----	-----	-----	-----

US 3635667	A	19720118	US 1970-57817	19700723 <--
DE 2133898	A	19720127	DE 1971-2133898	19710707 <--
FR 2099535	A1	19720317	FR 1971-25463	19710712 <--
BE 770008	A1	19720114	BE 1971-105919	19710714 <--
JP 51000966	B4	19760113	JP 1971-52470	19710716 <--
PRIORITY APPLN. INFO.:			US 1970-57812	19700723 <--
			US 1970-57817	19700723 <--

AB A mixt. of **hydrogen peroxide** [7722-84-1], **water**, and **ammonium hydroxide** [1336-21-6] was added to conventional drycleaning baths to improve the whiteness of fabrics without their damage. A **cleaning** bath contg. **perchloroethylene** 500, dodecylbenzenesulfonate isopropylamine salt 4, 50% **H2O2** 2, and 2% **NH4OH** 1 lb. **cleaned** cotton and cotton-Dacron blends more efficiently than similar compns. contg. no **H2O2**, **NH4OH**, and **water**.

IC D06L

NCL 008142000

CC 46 (Surface Active Agents and Detergents)

ST **hydrogen peroxide** drycleaning; **ammonium hydroxide** drycleaning; whiteness textile

IT **Detergents**

(dry-cleaning, contg. **ammonium hydroxide** and **hydrogen peroxide**, for improved whiteness)

IT 7722-84-1, uses and miscellaneous

RL: USES (Uses)

(**detergent** compns. contg. **ammonium hydroxide** and, for dry **cleaning** of textiles contg. cotton and Dacron with improved whiteness)

IT 1336-21-6

RL: USES (Uses)

(**detergent** compns. contg. **hydrogen peroxide** and, for dry **cleaning** of textiles contg. cotton and Dacron, with improved whiteness)

IT 7722-84-1, uses and miscellaneous

RL: USES (Uses)

(**detergent** compns. contg. **ammonium hydroxide** and, for dry **cleaning** of textiles contg. cotton and Dacron with improved whiteness)

IT 1336-21-6

RL: USES (Uses)

(**detergent** compns. contg. **hydrogen peroxide** and, for dry **cleaning** of textiles contg. cotton and Dacron, with improved whiteness)

L35 ANSWER 8 OF 9 HCA COPYRIGHT 2003 ACS on STN

ACCESSION NUMBER: 64:85640 HCA

ORIGINAL REFERENCE NO.: 64:16151a-b

TITLE: Rug-**cleaning** compositions

PATENT ASSIGNEE(S): Benjamin M. Hulsh

SOURCE: 5 pp.

DOCUMENT TYPE: Patent

LANGUAGE: Unavailable

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
-----	----	-----	-----	-----
US 3240713		19660315	US	19620802 <--
AB		Wood flour used in the above compns. is bleached in situ by including Na		

perborate (I), H<sub>2</sub>O<sub>2</sub> plus NH<sub>4</sub>OH, K<sub>2</sub>S<sub>2</sub>O<sub>8</sub>, or Na<sub>2</sub>S<sub>2</sub>O<sub>8</sub> in the mixt. The compn. contains wood flour 18-35, a bleaching agent 0.20-1.0, H<sub>2</sub>O 25-70, a low-boiling solvent 10-40, a nonionic and nonsoap org. **detergent** 0.25-1.0, Na<sub>3</sub>-PO<sub>4</sub>.12H<sub>2</sub>O (I), Na<sub>4</sub>P<sub>2</sub>O<sub>7</sub>, or K<sub>4</sub>P<sub>2</sub>O<sub>7</sub> 0.25-1.0, and, if desired, a cellulose dye 0.001-0.05%. Solvents include naphtha, mineral spirits, Stoddard solvent, CHCl<sub>3</sub>:CCl<sub>2</sub> (II), CCl<sub>4</sub>, MeCCl<sub>3</sub>, or their mixts. Thus, a compn. contains maplewood flour 25, H<sub>2</sub>O 38+, petroleum fraction 25, II 10, Na lauryl **sulfate** 0.5, Na<sub>3</sub>PO<sub>4</sub> 0.4, I 0.4, and Pontamine red dye 0.01% by wt.

NCL 252139000

CC 53 (Surface-Active Agents and Detergents)

IT Carpets and Rugs

(cleaning compns. for, with in situ bleaching of wood flour)

IT Wood

(flour or meal, rug **cleaning** compns. contg., with in situ bleaching agent)

IT Bleaching agents

(rug **cleaning** compns. contg., for in situ bleaching of wood flour)

L35 ANSWER 9 OF 9 HCA COPYRIGHT 2003 ACS on STN

ACCESSION NUMBER: 55:90281 HCA

ORIGINAL REFERENCE NO.: 55:17036d-h

TITLE: Flameproofing agents for cellulosic materials

INVENTOR(S): Coates, Harold

PATENT ASSIGNEE(S): Albright &amp; Wilson Ltd.

DOCUMENT TYPE: Patent

LANGUAGE: Unavailable

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 2983623		19610509	US	<--

AB The properties of cellulose are improved by treatment with a partially polymerized hydroxymethyl phosphorous compd. contg. .gtoreq. 1 free OH group attached to P and then exposing the cellulose in the dry state to the action of gaseous NH<sub>3</sub> followed by an aq. NH<sub>4</sub>OH treatment. Thus, a tetrakis(hydroxymethyl)phosphonium chloride, (THPC)-urea precondensate (I), was prepd. by refluxing THPC 3160 and urea 498 in H<sub>2</sub>O 4012 parts for 30 min. with subsequent rapid cooling. To the I, a nonionic **wetting agent** (alkyl phenyl **ethylene oxide** condensation product) 20, and H<sub>2</sub>O 5000 parts were added. A **scoured** and bleached cotton fabric was impregnated with this soln. and squeezed to retain 74 parts soln. per 100 parts fabric. The impregnated fabric was dried at 90-5.degree., and then exposed for 10 min. to NH<sub>3</sub> vapor by passing it over a NH<sub>4</sub>OH soln. (d. 0.910). The fabric was then treated in the NH<sub>4</sub>OH soln. (10 parts) in cold H<sub>2</sub>O (90 parts) for 10 min. The fabric was removed from soln. and without rinsing was washed in a soln. of soap 5 and H<sub>2</sub>O<sub>2</sub> (100 vol.) 2 in H<sub>2</sub>O 1000 parts for 10 min. at 40-50, then for 10 min. at 90-5.degree. before finally being rinsed in hot H<sub>2</sub>O, squeezed, and dried at 120.degree.. The dried fabric showed an increase of 11% in wt. compared to the original fabric. It had excellent resistance to burning and afterglow. This property was not impaired by subjecting the fabric to 10 successive 1-hr. boiling washes in a soln. of soap, 2, anhyd. Na<sub>2</sub>CO<sub>3</sub> 2, and H<sub>2</sub>O 1000 parts. Cf. U. S. 2,772,188 (CA 51, 7735c).

CC 25 (Dyes and Textiles)

IT Textiles

(fire- or flameproofing cotton, with phosphonium chloride deriv.-urea condensation products mixed with alkyl phenyl **ethylene** oxide condensate)

=> d L36 1-15 ibib abs hitind hitrn

L36 ANSWER 1 OF 15 HCA COPYRIGHT 2003 ACS on STN  
ACCESSION NUMBER: 139:93764 HCA  
TITLE: Method for post-etch and strip residue removal on coral films  
INVENTOR(S): Mikhaylichenko, Katrina; Ravkin, Michael; Delarios, John  
PATENT ASSIGNEE(S): Lam Research Corporation, USA  
SOURCE: PCT Int. Appl., 26 pp.  
CODEN: PIXXD2  
DOCUMENT TYPE: Patent  
LANGUAGE: English  
FAMILY ACC. NUM. COUNT: 1  
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2003058694	A1	20030717	WO 2002-US40987	20021220
W:	AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM			
RW:	GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG			

PRIORITY APPLN. INFO.: US 2001-33644 A 20011227

AB A method for **cleaning** a semiconductor **wafer** is provided which includes plasma etching a feature into a low K dielec. layer having a photoresist mask where the plasma etching generates etch residues. The method also includes ashing the semiconductor **wafer** to remove the photoresist mask where the ashing generating ashing residues. The method further includes removing the etching residues and the ashing residues from the low K dielec. layer where the removing is enhanced by **scrubbing** the low K dielec. layer of the semiconductor **wafer** with a wet brush that applies a fluid mixt. including a **cleaning** chem. and a **wetting agent**

IC ICM H01L021-20

ICS H01L021-336

CC 76-3 (Electric Phenomena)

ST semiconductor **wafer cleaning** etch residue removal

IT **Surfactants**

(method for post-etch and ashing residue removal by **cleaning** with fluid mixt.)

IT Semiconductor **device** fabrication

(**wafer**; method for post-etch and strip residue removal on coral films)

IT 7732-18-5, **Water**, uses

RL: NUU (Other use, unclassified); USES (Uses)

(deionized; method for post-etch and ashing residue removal by **cleaning** with fluid mixt.)

IT 1336-21-6, Ammonium hydroxide  
7722-84-1, Hydrogen peroxide, processes  
RL: CPS (Chemical process); NUU (Other use, unclassified); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)  
(method for post-etch and ashing residue removal by **cleaning** with fluid mixt.)

IT 7732-18-5, Water, uses  
RL: NUU (Other use, unclassified); USES (Uses)  
(deionized; method for post-etch and ashing residue removal by **cleaning** with fluid mixt.)

IT 1336-21-6, Ammonium hydroxide  
7722-84-1, Hydrogen peroxide, processes  
RL: CPS (Chemical process); NUU (Other use, unclassified); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)  
(method for post-etch and ashing residue removal by **cleaning** with fluid mixt.)

REFERENCE COUNT: 2 THERE ARE 2 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L36 ANSWER 2 OF 15 HCA COPYRIGHT 2003 ACS on STN

ACCESSION NUMBER: 136:111177 HCA

TITLE: Evaluation of **cleaning** results for semiconductor **wafers** in semiconductor **device** fabrication

INVENTOR(S): Ota, Katsuhiko; Takahara, Yoichi; Hara, Koji; Akimori, Hiroko; Tomioka, Hideki; Ito, Masaki; Tsugane, Masaru

PATENT ASSIGNEE(S): Hitachi Ltd., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 7 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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JP 2002016119	A2	20020118	JP 2000-200062	20000628
PRIORITY APPLN. INFO.:			JP 2000-200062	20000628
AB	Title method is based on the collection of data from a micro-groove structure (e.g., nitrides) formed on a sampling <b>wafer</b> , to evaluate the penetration and drying results of the <b>cleaning</b> soln.			
IC	ICM H01L021-66			
ICS	B08B003-04; B08B003-08; C11D007-08; C11D007-10; C11D007-18; C11D007-26; C11D007-50; C11D017-08; H01L021-3065; H01L021-304			
CC	76-3 (Electric Phenomena)			
	Section cross-reference(s): 46			
ST	nitride thin film sampling <b>wafer cleaning</b> evaluation groove structure			
IT	<b>Surfactants</b> (amphoteric; thin film-coated sampling <b>wafer</b> for evaluating <b>cleaning</b> result of)			
IT	<b>Surfactants</b> (anionic; thin film-coated sampling <b>wafer</b> for evaluating <b>cleaning</b> result of)			
IT	<b>Surfactants</b> (cationic; thin film-coated sampling <b>wafer</b> for evaluating <b>cleaning</b> result of)			
IT	Nitrides RL: TEM (Technical or engineered material use); USES (Uses)			

(for coating sampling **wafer** to evaluate **cleaning** result)

IT Solvents  
(org.; thin film-coated sampling **wafer** for evaluating **cleaning** result of)

IT Acids, uses  
RL: NUU (Other use, unclassified); USES (Uses)  
(org.; thin film-coated sampling **wafer** for evaluating **cleaning** result of)

IT Semiconductor materials  
(thin film-coated sampling **wafer** for evaluating **cleaning** result for)

IT Semiconductor **device** fabrication  
(thin film-coated sampling **wafer** for evaluating **cleaning** result in)

IT Alkali metal hydroxides  
Amines, uses  
RL: NUU (Other use, unclassified); USES (Uses)  
(thin film-coated sampling **wafer** for evaluating **cleaning** result of)

IT 12033-89-5, Silicon nitride (Si<sub>3</sub>N<sub>4</sub>), uses 25583-20-4, Titanium nitride  
RL: TEM (Technical or engineered material use); USES (Uses)  
(for coating sampling **wafer** to evaluate **cleaning** result)

IT 64-19-7, Acetic acid, uses 1336-21-6, Ammonia **water**  
7647-01-0, Hydrochloric acid, uses 7664-39-3, Hydrofluoric acid, uses  
7664-93-9, Sulfuric acid, uses 7697-37-2, Nitric acid, uses  
7722-84-1, **Hydrogen peroxide**, uses  
12125-01-8, Ammonium fluoride  
RL: NUU (Other use, unclassified); USES (Uses)  
(thin film-coated sampling **wafer** for evaluating **cleaning** result of)

IT 1336-21-6, Ammonia **water** 7722-84-1, **Hydrogen peroxide**, uses  
RL: NUU (Other use, unclassified); USES (Uses)  
(thin film-coated sampling **wafer** for evaluating **cleaning** result of)

L36 ANSWER 3 OF 15 HCA COPYRIGHT 2003 ACS on STN

ACCESSION NUMBER: 134:65061 HCA

TITLE: Silicon **wafer cleaning** process for  
post-chemical mechanical polishing using immersion in  
chem. megasonic baths

INVENTOR(S): Hackenberg, Diana

PATENT ASSIGNEE(S): Intersil Corp., USA

SOURCE: Eur. Pat. Appl., 6 pp.

CODEN: EPXXDW

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
EP 1065708	A2	20010103	EP 2000-104706	20000303
EP 1065708	A3	20020710		
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO				
US 6526995	B1	20030304	US 1999-342948	19990629
JP 2001044155	A2	20010216	JP 2000-173059	20000609

US 2003121528 A1 20030703 US 2003-358932 20030205  
PRIORITY APPLN. INFO.: US 1999-342948 A 19990629

AB Silicon **wafer cleaning** process includes steps of detg.  
the pH of substances on the surface of the **wafer**, adjusting the  
pH of a megasonic chem. bath to match the pH of the substance, immersing  
the **wafer** in a first chem. megasonic bath with a pH that matches  
the pH of the substance to be removed, **cleaning** the  
**wafer** in the megasonic bath.

IC ICM H01L021-306  
CC 76-3 (Electric Phenomena)  
ST silicon **wafer cleaning** chem mech polishing immersion  
IT **Surfactants**  
(NWC-601; silicon **wafer cleaning** process for  
post-chem. mech. polishing using immersion in chem. megasonic baths)

IT Polishing  
(chem.-mech.; silicon **wafer cleaning** process for  
post-chem. mech. polishing using immersion in chem. megasonic baths)

IT 1336-21-6, **Ammonium hydroxide** 7647-01-0,  
Hydrochloric acid, uses 7664-39-3, Hydrofluoric acid, uses 7664-93-9,  
Sulfuric acid, uses 7722-84-1, **Hydrogen**  
**peroxide**, uses 116263-65-1, Ammonium peroxide  
RL: NUU (Other use, unclassified); USES (Uses)  
(**cleaning** soln.; silicon **wafer cleaning**  
process for post-chem. mech. polishing using immersion in chem.  
megasonic baths)

IT 7732-18-5, **Water**, uses  
RL: NUU (Other use, unclassified); USES (Uses)  
(deionized; silicon **wafer cleaning** process for  
post-chem. mech. polishing using immersion in chem. megasonic baths)

IT 37204-13-0, SC-2 136376-36-8, SC-1  
RL: NUU (Other use, unclassified); USES (Uses)  
(silicon **wafer cleaning** process for post-chem.  
mech. polishing using immersion in chem. megasonic baths)

IT 7440-21-3, Silicon, uses  
RL: NUU (Other use, unclassified); USES (Uses)  
(**wafer**; silicon **wafer cleaning** process  
for post-chem. mech. polishing using immersion in chem. megasonic  
baths)

IT 1336-21-6, **Ammonium hydroxide**  
7722-84-1, **Hydrogen peroxide**, uses  
RL: NUU (Other use, unclassified); USES (Uses)  
(**cleaning** soln.; silicon **wafer cleaning**  
process for post-chem. mech. polishing using immersion in chem.  
megasonic baths)

IT 7732-18-5, **Water**, uses  
RL: NUU (Other use, unclassified); USES (Uses)  
(deionized; silicon **wafer cleaning** process for  
post-chem. mech. polishing using immersion in chem. megasonic baths)

L36 ANSWER 4 OF 15 HCA COPYRIGHT 2003 ACS on STN  
ACCESSION NUMBER: 134:7944 HCA  
TITLE: Wet-process **cleaning** and etching of copper  
surfaces in electronic or semiconductor assemblies  
INVENTOR(S): Verhaverbeke, Steven  
PATENT ASSIGNEE(S): CFMT, Inc., USA  
SOURCE: PCT Int. Appl., 32 pp.  
CODEN: PIXXD2  
DOCUMENT TYPE: Patent  
LANGUAGE: English  
FAMILY ACC. NUM. COUNT: 1

## PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2000071782	A1	20001130	WO 2000-US14019	20000519
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG				
EP 1198620	A1	20020424	EP 2000-936165	20000519
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL				
JP 2003500537	T2	20030107	JP 2000-620153	20000519
US 1999-135267P P 19990521 WO 2000-US14019 W 20000519				
PRIORITY APPLN. INFO.:				
AB	The Cu-contg. electronic components are processed by: (a) the 1st-stage <b>cleaning</b> with aq. oxidizing soln. contg. H <sub>2</sub> O <sub>2</sub> , O <sub>3</sub> , and/or Fe cyanide at pH .gtoreq.7; (b) rinsing with low-O <sub>2</sub> liq.; and (c) etching with aq. acidic soln. contg. HCl, H <sub>2</sub> SO <sub>4</sub> , HF, H <sub>3</sub> PO <sub>4</sub> , AcOH, citric acid, and/or tartaric acid for pH <5, as well as low dissolved O <sub>2</sub> to prevent reoxidn. The 1st-stage aq. soln. preferably contains H <sub>2</sub> O <sub>2</sub> and NH <sub>4</sub> OH at 1 vol. each in 5-200 vols. of <b>water</b> . The acidic etching soln. preferably contains <b>water</b> , HF, and HCl at the vol. ratio of (50-1000):1:1 and pH .ltoreq.3, optionally with a <b>surfactant</b> and/or corrosion inhibitor. The Cu-coated semiconductor <b>wafers</b> were <b>cleaned</b> using the aq. soln. having the <b>water:H<sub>2</sub>O<sub>2</sub>:NH<sub>4</sub>OH:surfactant</b> vol. ratio of 100:2.2:1.3:0.25, rinsed with deionized <b>water</b> , and etched with the acidic soln. having the <b>water:HF:HCl</b> vol. ratio of 100:0.2:1 with O <sub>2</sub> <100 ppb. The <b>cleaned</b> Cu showed contamination particle removal of 99.9% in the 18-400 .mu.m size range, vs. only .apprx.80% without the oxidizing or acidic stage.			
IC	ICM C23F003-00 ICS B08B003-00			
CC	56-6 (Nonferrous Metals and Alloys) Section cross-reference(s): 76			
ST	copper surface <b>cleaning</b> semiconductor <b>wafer</b> ; oxidizing aq bath <b>cleaning</b> copper elec circuit; acidic aq bath etch <b>cleaning</b> copper surface			
IT	Etching ( <b>cleaning</b> and; wet-process <b>cleaning</b> and etching of copper surfaces in electronic assemblies)			
IT	Semiconductor materials (copper-coated, <b>cleaning</b> of; wet-process <b>cleaning</b> and etching of copper surfaces in electronic assemblies)			
IT	Integrated circuits (copper-contg.; wet-process <b>cleaning</b> and etching of copper surfaces in electronic assemblies)			
IT	1336-21-6, <b>Ammonium hydroxide</b> 1948-47-6, Ferrous cyanide 7722-84-1, <b>Hydrogen peroxide</b> , uses 10028-15-6, Ozone, uses RL: MOA (Modifier or additive use); USES (Uses) ( <b>cleaning</b> bath contg.; wet-process <b>cleaning</b> and etching of copper surfaces in electronic assemblies)			
IT	7440-50-8, Copper, processes			



RL: PEP (Physical, engineering or chemical process); PROC (Process)  
(**cleaning** of; wet-process **cleaning** and etching of  
copper surfaces in electronic assemblies)  
IT 64-19-7, Acetic acid, uses 77-92-9, Citric acid, uses 87-69-4,  
Tartaric acid, uses 7647-01-0, Hydrochloric acid, uses 7664-38-2,  
Phosphoric acid, uses 7664-39-3, Hydrofluoric acid, uses 7664-93-9,  
Sulfuric acid, uses  
RL: MOA (Modifier or additive use); USES (Uses)  
(etch **cleaning** bath contg.; wet-process **cleaning**  
and etching of copper surfaces in electronic assemblies)  
IT 7440-21-3, Silicon, uses  
RL: TEM (Technical or engineered material use); USES (Uses)  
(semiconductor **wafers**, copper-coated; wet-process  
**cleaning** and etching of copper surface on semiconductor  
**wafers**)  
IT 1336-21-6, Ammonium hydroxide  
7722-84-1, Hydrogen peroxide, uses  
RL: MOA (Modifier or additive use); USES (Uses)  
(**cleaning** bath contg.; wet-process **cleaning** and  
etching of copper surfaces in electronic assemblies)  
REFERENCE COUNT: 7 THERE ARE 7 CITED REFERENCES AVAILABLE FOR THIS  
RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L36 ANSWER 5 OF 15 HCA COPYRIGHT 2003 ACS on STN  
ACCESSION NUMBER: 133:275225 HCA  
TITLE: Method for **cleaning** silicon **wafers**  
with deep trenches in semiconductor device  
fabrication  
INVENTOR(S): Lee, Kuei-Ying; Tao, Hun-Jan; Tsai, Chia-Shiung  
PATENT ASSIGNEE(S): Taiwan Semiconductor Manufacturing Company, Taiwan  
SOURCE: U.S., 8 pp.  
CODEN: USXXAM  
DOCUMENT TYPE: Patent  
LANGUAGE: English  
FAMILY ACC. NUM. COUNT: 1  
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 6129091	A	20001010	US 1996-725804	19961004

PRIORITY APPLN. INFO.: US 1996-725804 19961004

AB Current aq. methods for removal of polymeric materials from the sidewalls of trenches etched into silicon **wafers** by reactive-ion-etching are inadequate for treating deep trenches having high aspect ratios. Spin-dry operations performed after the aq. etching are incapable of completely removing rinse **water** and ionic species from these deep trenches, thereby leaving pockets of liq. Subsequent evapn. of these pockets results in the concn. and eventual pptn. of residual ionic species creating watermarks. A two-stage **cleaning** method is described in which the first stage dissolves the sidewall polymer and the second stage draws ionic species strongly chemisorbed onto the silicon surfaces into soln. A key feature of the method is that the **wafer** surface is not permitted to dry until after the final rinse. The method includes treating RIE etched silicon **wafer** with 1st soln. contg. hydrofluoric acid and a **surfactant**, rinsing with deionized **water**, immersing in 2nd soln. contg. H2O2 and NH4OH, rinsing with deionized **water**, and then drying.

IC ICM B08B003-08  
ICS B08B003-12  
NCL 134003000

CC 76-3 (Electric Phenomena)  
ST **cleaning** silicon **wafer** deep trench; semiconductor  
device fabrication silicon **wafer** **cleaning**;  
DRAM deep trench silicon **wafer** **cleaning**  
IT Memory **devices**  
(DRAM (dynamic random access), fabrication of; **cleaning** of  
silicon **wafers** with deep trenches in semiconductor  
device fabrication)  
IT **Cleaning**  
Semiconductor device fabrication  
(**cleaning** of silicon **wafers** with deep trenches in  
semiconductor device fabrication)  
IT MOS **devices**  
(complementary, fabrication; **cleaning** of silicon  
**wafers** with deep trenches in semiconductor device  
fabrication)  
IT Sputtering  
Sputtering  
(etching, reactive, **cleaning** after; **cleaning** of  
silicon **wafers** with deep trenches in semiconductor  
device fabrication)  
IT Washing  
(rinsing; **cleaning** of silicon **wafers** with deep  
trenches in semiconductor device fabrication)  
IT **Surfactants**  
(soln. contg.; **cleaning** of silicon **wafers** with deep  
trenches in semiconductor device fabrication)  
IT Etching  
Etching  
(sputter, reactive, **cleaning** after; **cleaning** of  
silicon **wafers** with deep trenches in semiconductor  
device fabrication)  
IT 7732-18-5, **Water**, uses  
RL: NUU (Other use, unclassified); USES (Uses)  
(deionized, for rinsing; **cleaning** of silicon **wafers**  
with deep trenches in semiconductor device fabrication)  
IT 1336-21-6, **Ammonium hydroxide** ((NH<sub>4</sub>  
) (OH)) 7664-39-3, Hydrofluoric acid, uses 7722-84-1,  
**Hydrogen peroxide**, uses  
RL: NUU (Other use, unclassified); USES (Uses)  
(soln. contg.; **cleaning** of silicon **wafers** with deep  
trenches in semiconductor device fabrication)  
IT 7440-21-3, Silicon, processes  
RL: DEV (Device component use); PEP (Physical, engineering or chemical  
process); PROC (Process); USES (Uses)  
(**wafers**; **cleaning** of silicon **wafers** with  
deep trenches in semiconductor device fabrication)  
IT 7732-18-5, **Water**, uses  
RL: NUU (Other use, unclassified); USES (Uses)  
(deionized, for rinsing; **cleaning** of silicon **wafers**  
with deep trenches in semiconductor device fabrication)  
IT 1336-21-6, **Ammonium hydroxide** ((NH<sub>4</sub>  
) (OH)) 7722-84-1, **Hydrogen peroxide**  
, uses  
RL: NUU (Other use, unclassified); USES (Uses)  
(soln. contg.; **cleaning** of silicon **wafers** with deep  
trenches in semiconductor device fabrication)  
REFERENCE COUNT: 8 THERE ARE 8 CITED REFERENCES AVAILABLE FOR THIS  
RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L36 ANSWER 6 OF 15 HCA COPYRIGHT 2003 ACS on STN

ACCESSION NUMBER: 132:86406 HCA

TITLE: The effect of **surfactants** in **NH4OH**

on silicon surfaces and particles removal

AUTHOR(S): Park, Jin-Woo; Park, Jin-Goo; Kim, Ki-Sub; Song, Hyung-Soo

CORPORATE SOURCE: Dep. Metall. Materials Eng., Hanyang Univ., Ansan, 425-791, Peop. Rep. China

SOURCE: Han'guk Chaelyo Hakhoechi (1999), 9(9), 872-877

CODEN: HCHAEU; ISSN: 1225-0562

PUBLISHER: Materials Research Society of Korea

DOCUMENT TYPE: Journal

LANGUAGE: Korean

AB The purpose of this research was to study the characteristics and the **cleaning** efficiency of **NH4OH** solns. added with **H2O2** and **surfactants**. **NH4OH** solns. added with **surfactants** did not show much changes in pH and redox potential (Eh) as a function of **NH4OH** concn. compared with **NH4OH** increased. The decrease of surface tension from 72 dynes/cm to 38 dynes/cm was obsd. in solns. added with **surfactant** but not in **H2O2** and **surfactant** added **NH2OH** solns. SC1(**NH4OH:H2O** = 1:1:5) soln. removed the PSL particles (0.67.mu.m in diam.) on Si **wafers** effectively at all temps. studied. **NH4OH** soln. added with a **surfactant** could not remove particles at room temp., however it was possible to remove particles at higher temps., 50.degree. and 80.degree..

CC 76-3 (Electric Phenomena)

ST **surfactant** ammonia **cleaning** silicon

IT **Cleaning**

Surface tension

**Surfactants**

(effect of **surfactants** in ammonium

**hydroxide** on silicon surfaces and particles removal)

IT 7440-21-3, Silicon, processes

RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)

(effect of **surfactants** in ammonium

**hydroxide** on silicon surfaces and particles removal)

IT 9003-53-6, Polystyrene

RL: REM (Removal or disposal); PROC (Process)

(effect of **surfactants** in ammonium

**hydroxide** on silicon surfaces and particles removal)

IT 1336-21-6, Ammonium hydroxide ((**NH4**

)(**OH**)) 7722-84-1, Hydrogen peroxide

, uses 119978-24-4, NCW601A

RL: TEM (Technical or engineered material use); USES (Uses)

(effect of **surfactants** in ammonium

**hydroxide** on silicon surfaces and particles removal)

IT 1336-21-6, Ammonium hydroxide ((**NH4**

)(**OH**)) 7722-84-1, Hydrogen peroxide

, uses

RL: TEM (Technical or engineered material use); USES (Uses)

(effect of **surfactants** in ammonium

**hydroxide** on silicon surfaces and particles removal)

L36 ANSWER 7 OF 15 HCA COPYRIGHT 2003 ACS on STN

ACCESSION NUMBER: 127:178012 HCA

TITLE: Semiconductor **wafer cleaning** system

INVENTOR(S): Olesen, Michael B.; Bran, Mario E.

PATENT ASSIGNEE(S): Verteq, Inc., USA  
 SOURCE: U.S., 25 pp., Cont.-in-part of U.S. Ser. No. 140,290,  
 abandoned.  
 CODEN: USXXAM  
 DOCUMENT TYPE: Patent  
 LANGUAGE: English  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 5656097	A	19970812	US 1994-361139	19941221
US 5908509	A	19990601	US 1997-908330	19970807
US 5996595	A	19991207	US 1997-908345	19970807
US 6158445	A	20001212	US 1999-358568	19990720
US 6378534	B1	20020430	US 2000-694938	20001023

PRIORITY APPLN. INFO.:

US 1993-140290	B2	19931020
US 1994-361139	A3	19941221
US 1997-910033	A3	19970811
US 1999-358568	A1	19990720

- AB Semiconductor **wafers** are positioned in a single **cleaning** tank and subjected to sequential flows of .gtoreq.1 highly dild. **cleaning** solns. that are injected from the lower end of the tank and allowed to overflow at the upper end, followed by rinse **water** after the dil. **cleaning** soln. is dumped. One soln. contains 1 part **NH4OH**, 2 parts **H2O2**, and 300-600 parts deionized **H2O**, and a trace of high purity **surfactant**. A second soln. contains highly dil. **HF**. A third soln. of **H2O2** is more dil. than the first soln. A fourth soln. contains **HCl** greatly dild. with deionized **H2O**. Quick dump valves in the tank bottom enable the solns. to be quickly dumped followed by .gtoreq.1 rinse steps, including a quick refill while spraying and then dumping of the rinsing **H2O**. **Cleaning** is assisted by application of megasonic energy.
- IC ICM B08B003-08  
 ICS B08B003-12; B08B007-02; C23G001-02
- NCL 134001000
- CC 46-6 (Surface Active Agents and Detergents)  
 Section cross-reference(s): 76
- ST **cleaning** solvent semiconductor **wafer**; **ammonium hydroxide cleaning** solvent; hydrofluoric acid **cleaning** solvent; hydrochloric acid **cleaning** solvent; **hydrogen peroxide cleaning** solvent; sonic vibration **cleaning** semiconductor **wafer**
- IT **Cleaning**  
 (megasonic; semiconductor **wafer cleaning** system using multiple flows of very dil. solvents and sonication)
- IT **Cleaning** solvents  
 (semiconductor **wafer cleaning** system using multiple flows of very dil. solvents and sonication)
- IT Semiconductor materials  
 (**wafer**; semiconductor **wafer cleaning** system using multiple flows of very dil. solvents and sonication)
- IT 1336-21-6, **Ammonium hydroxide** ((**NH4**)(**OH**)) 7647-01-0, Hydrochloric acid, uses 7664-39-3, Hydrofluoric acid, uses 7722-84-1, **Hydrogen peroxide**, uses  
 RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)  
 (semiconductor **wafer cleaning** system using multiple flows of very dil. solvents and sonication)

IT 1336-21-6, Ammonium hydroxide ((NH<sub>4</sub>)(OH)) 7722-84-1, Hydrogen peroxide, uses

RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)  
(semiconductor **wafer cleaning** system using multiple flows of very dil. solvents and sonication)

L36 ANSWER 8 OF 15 HCA COPYRIGHT 2003 ACS on STN

ACCESSION NUMBER: 125:46159 HCA

TITLE: Proposal of advanced wet **cleaning** of silicon surface

AUTHOR(S): Ohmi, Tadahiro

CORPORATE SOURCE: Dep. Electron., Tohoku Univ., Sendai, 980, Japan

SOURCE: Proceedings - Electrochemical Society (1996), 95-20 (Cleaning Technology in Semiconductor Device Manufacturing), 1-12  
CODEN: PESODO; ISSN: 0161-6374

PUBLISHER: Electrochemical Society

DOCUMENT TYPE: Journal

LANGUAGE: English

AB Ultraclean **wafer** surface is crucial for high quality processing in Si technologies. **Cleaning** of Si **wafer** surface was provided by RCA wet **cleaning** for this quarter century, where there exist high temp. processes consisting of H<sub>2</sub>SO<sub>4</sub>/H<sub>2</sub>O<sub>2</sub>/H<sub>2</sub>O, NH<sub>4</sub>OH/H<sub>2</sub>O<sub>2</sub>/H<sub>2</sub>O and HCl/H<sub>2</sub>O<sub>2</sub>/H<sub>2</sub>O treatment. Thus, RCA **cleaning** requires a large no. of processing steps, resulting in requirements of huge consumption vol. of liq. chems. and ultrapure H<sub>2</sub>O, and simultaneously huge vol. of **clean** air exhaust to suppress chem. vapor getting into **clean** room. Total room temp. wet **cleaning** consisting of five **cleaning** steps was developed for Si **wafer** surface, where consumption vol. of liq. chems. and ultrapure H<sub>2</sub>O was reduced dramatically <1/20 compared to that of RCA **cleaning**. The newly developed **cleaning** technol. was confirmed to contribute to future simplified and low cost manufg. of ULSI.

CC 76-3 (Electric Phenomena)

Section cross-reference(s): 48, 66, 67

ST **cleaning** silicon distd **water** hydrogen fluoride

IT Semiconductor **devices**

Sound and Ultrasound

**Surfactants**

(five-step wet-**cleaning** process for silicon **wafers** with low consumption of liq. chems. and ultrapure **water**)

IT Particles

(removal of; five-step wet-**cleaning** process for silicon **wafers** with low consumption of liq. chems. and ultrapure **water**)

IT 7664-39-3, Hydrogen fluoride, processes 7722-84-1,

**Hydrogen peroxide**, processes 7732-18-5,

**Water**, processes 10028-15-6, Ozone, processes

RL: NUU (Other use, unclassified); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)

(five-step wet-**cleaning** process for silicon **wafers** with low consumption of liq. chems. and ultrapure **water**)

IT 7440-21-3, Silicon, processes

RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)

(five-step wet-**cleaning** process for silicon **wafers**)

with low consumption of liq. chems. and ultrapure water)  
 IT 7440-22-4, Silver, processes 7440-50-8, Copper, processes  
 RL: REM (Removal or disposal); PROC (Process)  
 (five-step wet-cleaning process for silicon wafers  
 with low consumption of liq. chems. and ultrapure water)  
 IT 7722-84-1, Hydrogen peroxide, processes  
 7732-18-5, Water, processes  
 RL: NUU (Other use, unclassified); PEP (Physical, engineering or chemical  
 process); PROC (Process); USES (Uses)  
 (five-step wet-cleaning process for silicon wafers  
 with low consumption of liq. chems. and ultrapure water)

L36 ANSWER 9 OF 15 HCA COPYRIGHT 2003 ACS on STN  
 ACCESSION NUMBER: 124:264105 HCA  
 TITLE: **Cleaning of semiconductor devices**  
 INVENTOR(S): Kawahara, Hiroyuki  
 PATENT ASSIGNEE(S): Matsushita Electronics Corp, Japan  
 SOURCE: Jpn. Kokai Tokkyo Koho, 4 pp.  
 CODEN: JKXXAF  
 DOCUMENT TYPE: Patent  
 LANGUAGE: Japanese  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 08017775	A2	19960119	JP 1994-146266	19940628
PRIORITY APPLN. INFO.:			JP 1994-146266	19940628
AB	Solns. for <b>cleaning</b> at 65-75.degree. contain 0.6-1.5% <b>NH4OH</b> , 2-2.5% <b>H2O2</b> , and <b>H2O</b> .			
IC	ICM H01L021-304 ICS C11D007-04; C11D007-06; C11D007-18; H01L021-308			
CC	46-6 (Surface Active Agents and Detergents) Section cross-reference(s): 76			
ST	<b>cleaning silicon wafer; ammonium hydroxide cleaning soln; hydrogen peroxide cleaning soln</b>			
IT	<b>Semiconductor devices</b> (silicon wafers; cleaning solns. contg. <b>ammonium hydroxide</b> and <b>hydrogen peroxide</b> for semiconductor devices)			
IT	<b>Detergents</b> (cleaning compns., cleaning solns. contg. <b>ammonium hydroxide</b> and <b>hydrogen peroxide</b> for semiconductor devices)			
IT	1336-21-6, <b>Ammonium hydroxide</b> ((NH4 ) (OH)) 7722-84-1, <b>Hydrogen peroxide</b> , uses RL: TEM (Technical or engineered material use); USES (Uses) (cleaning solns. contg. <b>ammonium hydroxide</b> and <b>hydrogen peroxide</b> for semiconductor devices)			
IT	7440-21-3, <b>Silicon</b> , uses RL: DEV (Device component use); USES (Uses) (wafers; cleaning solns. contg. <b>ammonium hydroxide</b> and <b>hydrogen peroxide</b> for semiconductor devices)			
IT	1336-21-6, <b>Ammonium hydroxide</b> ((NH4 ) (OH)) 7722-84-1, <b>Hydrogen peroxide</b> , uses			

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RL: TEM (Technical or engineered material use); USES (Uses)  
(**cleaning** solns. contg. **ammonium hydroxide**  
and **hydrogen peroxide** for semiconductor  
devices)

L36 ANSWER 10 OF 15 HCA COPYRIGHT 2003 ACS on STN

ACCESSION NUMBER: 122:202039 HCA

TITLE: The wet process technology in the semiconductor  
manufacturing process. Advanced wet **cleaning**  
technology

AUTHOR(S): Ohmi, Tadahiro

CORPORATE SOURCE: Fac. Eng., Tohoku Univ., Sendai, 980-77, Japan

SOURCE: Denki Kagaku oyobi Kogyo Butsuri Kagaku (1995), 63(3),  
184-8

CODEN: DKOKAZ; ISSN: 0366-9297

DOCUMENT TYPE: Journal; General Review

LANGUAGE: Japanese

AB A review, with 6 refs., on **cleaning** of silicon wafers  
with **NH4OH-H2O2-H2O-surfactant** or  
O3-contg. pure **water**.

CC 76-0 (Electric Phenomena)

ST review silicon **wafer cleaning** semiconductor

IT Semiconductor **devices**

**Surfactants**

(**cleaning** of silicon **wafer** in manuf. of  
semiconductor **device**)

IT 7440-21-3, Silicon, processes

RL: DEV (Device component use); PEP (Physical, engineering or chemical  
process); PROC (Process); USES (Uses)

(**cleaning** of silicon **wafer** in manuf. of  
semiconductor **device**)

IT 1336-21-6, **Ammonium hydroxide**

7722-84-1, **Hydrogen peroxide**, uses

10028-15-6, **Ozone**, uses

RL: NUU (Other use, unclassified); USES (Uses)

(**cleaning** of silicon **wafer** in manuf. of  
semiconductor **device**)

IT 1336-21-6, **Ammonium hydroxide**

7722-84-1, **Hydrogen peroxide**, uses

RL: NUU (Other use, unclassified); USES (Uses)

(**cleaning** of silicon **wafer** in manuf. of  
semiconductor **device**)

L36 ANSWER 11 OF 15 HCA COPYRIGHT 2003 ACS on STN

ACCESSION NUMBER: 121:159790 HCA

TITLE: Dilute ammonia-**hydrogen peroxide**  
solution **detergents** for particle removal  
from **wafers**

INVENTOR(S): Kokubu, Katsunori

PATENT ASSIGNEE(S): Sony Corp, Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 4 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 06112179	A2	19940422	JP 1992-261270	19920930

PRIORITY APPLN. INFO.: JP 1992-261270 19920930

AB The title **detergents** contain **ammonium hydroxide**, aq. **hydrogen peroxide**, and pure **water** with the pure **water** content 20-100 times the overall vol. of **ammonium hydroxide** and aq. **hydrogen peroxide**.

IC ICM H01L021-304

ICS C11D007-18

CC 46-6 (Surface Active Agents and Detergents)

Section cross-reference(s): 76

ST particle removal **wafer ammonium hydroxide**;  
**hydrogen peroxide** particle removal **wafer**

IT Semiconductor **devices**

(manuf. of, **wafer cleaning** in, dil. ammonia-  
**hydrogen peroxide** for)

IT **Detergents**

(**cleaning** compns., dil. ammonia-**hydrogen peroxide**, for particle removal from **wafers**)

IT 7722-84-1, **Hydrogen peroxide**, uses

RL: USES (Uses)

(dil. soln. contg. **ammonium hydroxide** and, for  
particle removal from **wafers**)

IT 1336-21-6, **Ammonium hydroxide**

RL: USES (Uses)

(dil. soln. contg. **hydrogen peroxide** and, for  
particle removal from **wafers**)

IT 7440-21-3, **Silicon**, uses

RL: USES (Uses)

(**wafer**, particle removal from, dil. ammonia-**hydrogen peroxide** solns. for)

IT 7722-84-1, **Hydrogen peroxide**, uses

RL: USES (Uses)

(dil. soln. contg. **ammonium hydroxide** and, for  
particle removal from **wafers**)

IT 1336-21-6, **Ammonium hydroxide**

RL: USES (Uses)

(dil. soln. contg. **hydrogen peroxide** and, for  
particle removal from **wafers**)

L36 ANSWER 12 OF 15 HCA COPYRIGHT 2003 ACS on STN

ACCESSION NUMBER: 120:336073 HCA

TITLE: Improved wet chemical **cleaning** for  
realization of ultraclean **wafer** surface

AUTHOR(S): Ohmi, Tadahiro; Imaoka, Takashi; Takano, Jun;  
Kunimoto, Fumitomo

CORPORATE SOURCE: Dep. Elec., Tohoku Univ., Sendai, 980, Japan

SOURCE: Particulate Science and Technology (1993), 11(3-4),  
229-43

CODEN: PTCHDS; ISSN: 0272-6351

DOCUMENT TYPE: Journal

LANGUAGE: English

AB The improved wet **cleaning** process is described.. Several new technologies are incorporated in this process. The ozone-added ultrapure **water** rinsing technol. (O3-H2O) has made it possible to completely remove trace org. mols. adsorbed on the **wafer** surface at room temp. The optimal compn. of the NH4OH-H2O2-H2O soln. has been found to maximize the particle removal efficiency without increasing surface microroughness at all. The DHF-H2O2 **cleaning** technol. is very effective in removing metals such as Cu that take electrons from Si to directly bind with the Si

- surface. This **cleaning** technol. is also effective in removing native oxide. The technol. to terminate the Si surface with hydrogen is also employed. Hot ultrapure **water** is used for this purpose.
- CC 76-3 (Electric Phenomena)
- ST silicon **wafer cleaning** ammonia hydrofluoric acid; **hydrogen peroxide** copper impurity **cleaning**; diode breakdown silicon **cleaning** ozone
- IT Electric breakdown  
(of silicon, wet **cleaning** process effect on)
- IT **Surfactants**  
(removal of, from silicon, wet **cleaning** process for)
- IT Diodes  
(silicon-based, characteristics of, wet **cleaning** process effect on)
- IT Electric resistance  
(contact, of aluminum on silicon, wet **cleaning** process effect on)
- IT 7429-90-5, Aluminum, properties  
RL: PRP (Properties)  
(contact resistance of, on silicon, wet **cleaning** process effect on)
- IT 7440-50-8, Copper, miscellaneous  
RL: MSC (Miscellaneous)  
(removal of impurities of, from silicon surface, wet **cleaning** process for)
- IT 7440-21-3, Silicon, uses  
RL: USES (Uses)  
(wet chem. process of **cleaning** of, diode characteristics in relation to)
- IT 7727-37-9, Nitrogen, uses  
RL: USES (Uses)  
(wet **cleaning** process of silicon **wafers** sealed under)
- IT 7647-01-0, Hydrochloric acid, uses 7664-39-3, Hydrofluoric acid, uses 7664-41-7, Ammonia, uses 7722-84-1, **Hydrogen peroxide**, uses 10028-15-6, Ozone, uses  
RL: USES (Uses)  
(wet **cleaning** using, of silicon surface, diode breakdown in relation to)
- IT 7722-84-1, **Hydrogen peroxide**, uses  
RL: USES (Uses)  
(wet **cleaning** using, of silicon surface, diode breakdown in relation to)

L36 ANSWER 13 OF 15 HCA COPYRIGHT 2003 ACS on STN

ACCESSION NUMBER: 118:203330 HCA

TITLE: Segregation and removal of metallic impurity at interface of silicon and fluorine etchant

AUTHOR(S): Ohmi, Tadahiro; Imaoka, Takashi; Kezuka, Takehiko; Takano, Jun; Kogure, Masahiko

CORPORATE SOURCE: Dep. Electron., Tohoku Univ., Sendai, 980, Japan

SOURCE: Journal of the Electrochemical Society (1993), 140(3), 811-18

CODEN: JESOAN; ISSN: 0013-4651

DOCUMENT TYPE: Journal

LANGUAGE: English

AB The segregation and removal of metallic impurities were studied at the solid/liq. interface between chems. and various Si **wafer** surfaces (p, n, p, n+). Several ilmpurities employed in the process were studied for the removal of oxide from Si surface. Metals featuring high

electronegativity (such as Cu) are directly adsorbed on the bare Si surface while taking electrons away from the Si surface. These metals are hard to remove. Cu was used as the representative of metals to be directly adsorbed on the bare Si surface and studied its segregation and removal at the solid/liq. interface between Si wafer and impurities to keep the Si surface bare such as DHF, DHF-H2O2, and BHF. Cu ion in DHF adheres on every Si wafer surface that were used in the study (p, n, p+, n+), esp. on the n+-Si surface. The DHF-H2O2 soln. is effective in removing metals featuring high electronegativity such as Cu from the p-Si and n-Si wafers. Even when the DHF-H2O2 soln. has Cu ions at the concn. of 1 ppm, this soln. is effective in cleaning the wafer. In the case of the n+-Si and p+-Si wafers, however, their surfaces get contaminated with Cu when Cu ion of 10 ppb remains in the DHF-H2O2 soln. When BHF is used, Cu in BHF is more likely to contaminate the p-Si, n-Si, and p+-Si wafers but is less likely to contaminate the n+-Si wafer. The surfactant added to BHF to improve its wettability onto the Si wafer is effective in preventing Cu pptn. onto the p-Si, n-Si, and p+-Si wafers. This effect of the surfactant, however, is not obsd. on the n+-Si wafer. The surface microroughness on the n+-Si wafer is increased when it is immersed in the DHF-H2O2 soln. for 10 min. The etch rate of DHF-H2O2 and BHF on the n+-Si wafer is much higher than that on the other Si wafers. To suppress the metallic contamination on every type of Si surface <1 .times. 10<sup>10</sup> atom/cm<sup>2</sup>, the metallic concn. in ultrapure H<sub>2</sub>O and high-purity DHF which is employed at the final stage of the cleaning process must be lowered below the part per trillion level. DHF-H2O2 cleaning is effective in removing metallic impurities on the p and n surfaces which are required to feature extremely high cleanliness level, such as the wafer surface before gate oxidn. The DHF-H2O2 soln., however, degrades surface roughness on the substrate with the n+ and p+ surfaces. To remove metallic impurities on these surfaces, there is no choice at present but to use the NH<sub>4</sub>OH-H<sub>2</sub>O<sub>2</sub>-H<sub>2</sub>O cleaning and the HCl-H<sub>2</sub>O<sub>2</sub>-H<sub>2</sub>O cleaning.

- CC 76-14 (Electric Phenomena)  
Section cross-reference(s): 66, 67
- ST copper impurity segregation removal silicon interface; metallic impurity segregation silicon interface etchant; silicon wafer cleaning DHF peroxide soln
- IT 1336-21-6, Ammonium hydroxide  
RL: USES (Uses)  
(segregation and removal of metallic impurity from interface of silicon with, in cleaning process)
- IT 7664-39-3, Hydrofluoric acid, properties 7722-84-1, Hydrogen peroxide, properties  
RL: PRP (Properties)  
(segregation and removal of metallic impurity from interface of silicon with, in cleaning process)
- IT 1336-21-6, Ammonium hydroxide  
RL: USES (Uses)  
(segregation and removal of metallic impurity from interface of silicon with, in cleaning process)
- IT 7722-84-1, Hydrogen peroxide, properties  
RL: PRP (Properties)  
(segregation and removal of metallic impurity from interface of silicon with, in cleaning process)

ACCESSION NUMBER: 115:292796 HCA  
TITLE: Preventing metallic contamination of semiconductor  
          **devices**  
INVENTOR(S): Tateno, Toshio; Kawasaki, Yoshio; Okada, Tomokatsu  
PATENT ASSIGNEE(S): Morita Kagaku Kogyo Co., Ltd., Japan  
SOURCE: Jpn. Kokai Tokkyo Koho, 5 pp.  
          CODEN: JKXXAF  
DOCUMENT TYPE: Patent  
LANGUAGE: Japanese  
FAMILY ACC. NUM. COUNT: 1  
PATENT INFORMATION:

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
	-----	---	-----	-----	-----
	JP 03053083	A2	19910307	JP 1989-189518	19890720
PRIORITY APPLN. INFO.:				JP 1989-189518	19890720
AB	The process uses a mixed aq. soln. from .gtoreq.2 of HF, aq. NH4F, H2O4, NH4OH, H2SO4, HCl, HNO3, alc., and pure H2O, for <b>cleaning</b> semiconductor <b>devices</b> or for etching, which contains a 1-50-ppm anionic <b>surfactant</b> (s) from CxHyCOOH, CxHySO3H, CxFyCOOH, CxFySO3H, (x = 4-7 integer; and y = 9-15 integer), or its salt.				
IC	ICM C23F001-24 ICS H01L021-304; H01L021-308				
CC	76-3 (Electric Phenomena)				
ST	semiconductor <b>device</b> metallic contamination prevention				
IT	Alcohols, uses and miscellaneous RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses) (aq. solns. of, contg. <b>surfactants</b> for preventing metallic contamination of semiconductor <b>devices</b> )				
IT	Semiconductor <b>devices</b> (metallic-contamination prevention of, aq. solns. contg. anionic <b>surfactants</b> for)				
IT	<b>Surfactants</b> (anionic, aq. solns. contg., for preventing metallic contamination of semiconductor <b>devices</b> )				
IT	111-14-8, Heptanoic acid	307-24-4	375-85-9	60586-80-3,	
	1-Heptanesulfonic acid RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses) (aq. solns. contg., for preventing metallic-contamination of semiconductor <b>devices</b> )				
IT	7647-01-0, Hydrochloric acid, uses and miscellaneous		7664-39-3,		
	Hydrofluoric acid, uses and miscellaneous		7664-41-7, Ammonia, uses and		
	miscellaneous		7664-93-9, Sulfuric acid, uses and miscellaneous		
	7697-37-2, Nitric acid, uses and miscellaneous		7722-84-1,		
	<b>Hydrogen peroxide</b> , uses and miscellaneous		12125-01-8,		
	Ammonium fluoride (NH4F)				
	RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses) (aq. solns. of, contg. <b>surfactants</b> for preventing metallic contamination of semiconductor <b>devices</b> )				
IT	7732-18-5, <b>Water</b> , uses and miscellaneous				
	RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses) ( <b>surfactant</b> -contg., for preventing metallic contamination of semiconductor <b>devices</b> )				
IT	7722-84-1, <b>Hydrogen peroxide</b> , uses and				
	miscellaneous				

RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)  
(aq. solns. of, contg. **surfactants** for preventing metallic contamination of semiconductor **devices**)

IT **7732-18-5, Water**, uses and miscellaneous  
RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)  
(**surfactant**-contg., for preventing metallic contamination of semiconductor **devices**)

L36 ANSWER 15 OF 15 HCA COPYRIGHT 2003 ACS on STN

ACCESSION NUMBER: 72:84930 HCA  
TITLE: Chromium patterns by photogravure  
INVENTOR(S): Cashau, George R.; George, James W.  
PATENT ASSIGNEE(S): Western Electric Co., Inc.  
SOURCE: Fr., 7 pp.  
CODEN: FRXXAK  
DOCUMENT TYPE: Patent  
LANGUAGE: French  
FAMILY ACC. NUM. COUNT: 2  
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
FR 1576139	A	19690725	FR 1968-1576139	19680805
US 3542612	A	19701124	US 1967-659896	19670811

PRIORITY APPLN. INFO.: US 1967-659896 19670811

AB For practically pinhole-free, long-lasting patterns for high precision work, such as semiconductor **devices** and integrated circuits, soda-lime glass is boiled in an inorg. caustic **detergent**, then in **H2O2**, rinsed with deionized **water**, and dried 30 min at 120.degree.. A 50-nm layer of Cr is vacuum-deposited and blown with an air jet (4.22 kg/cm<sup>2</sup>) to remove any loose Cr. The loosened Cr particles are believed to carry with them the impurities on the glass surface interfering with the adhesion of the metal, so that a 2nd 50-nm Cr coating results in a pinhole-free layer of Cr. A photoresist is applied and the bared Cr etched with H<sub>2</sub>SO<sub>4</sub>-H<sub>3</sub>PO<sub>4</sub>. The etch action is stopped by immersion in **NH<sub>4</sub>OH**, the resist removed, and the Cr pattern **cleaned** with NaOH.

IC G03F

CC 74 (Radiation Chemistry, Photochemistry, and Photographic Processes)

=> d L41 1-11 cbib abs hitind hitrn

L41 ANSWER 1 OF 11 HCA COPYRIGHT 2003 ACS on STN

132:323339 Textile spot and stain remover composition and preparation therefor. Whiteley, Reginald Keith; Whiteley, Bruce Alan (Australia). Pat. Specif. (Aust.) AU 711246 B2 **19991007**, 25 pp. (English). CODEN: ALXXAP. APPLICATION: AU 1995-20140 19950518. PRIORITY: AU 1994-5759 19940523.

AB The heavy duty spot and stain remover of the present invention is an aq. **cleansing** compn. comprising: (a) an anionic or nonionic **surfactant** suitable for use on dyed textile fibers, in an amt. of from 0.05-2.5 wt.% of the compn.; (b) a polar solvent or mixt. of solvents comprising a glycol contg. 5 to 13 carbon atoms and/or an alc. contg. 6 or more carbon atoms; (c) an effective quantity of active peroxyhydrate oxidizing agent, suitable for use on dyed textile fibers; (d) a transition metal present in the form of an aq. ammonium complex in an amt. of 2.5-200 ppm of metal; (e) a **water** sol. resin selected from the group

consisting of styrene maleic anhydrides, styrene acrylic anhydrides, polyacrylic resins, and derivs. thereof in an amt. of 0.10-5.0 wt.% of dry resin in the compn.; and (f) sufficient **ammonium hydroxide** to raise the pH of the soln. to between 7.0 and 12.5.

The **cleansing** compn. provides a simple and effective improvement on current methods of removing spots and stains from textile fabrics.

IC ICM C11D001-14

ICS C11D001-66; C11D001-83; C11D003-44; C11D003-39; C11D003-37

CC 46-6 (Surface Active Agents and Detergents)

Section cross-reference(s): 43

ST textile stain spot **cleansing** compn prepn; **surfactant**  
solvent oxidant metal ammonia **cleaner**

IT **Surfactants**

(anionic, sodium laurylsulfate; prepn. of textile spot and stain remover comprising)

IT **Surfactants**

(nonionic; prepn. of textile spot and stain remover comprising)

IT **Detergents**

(stain removers; prepn. of textile spot and stain remover)

IT Polymers, uses

RL: MOA (Modifier or additive use); TEM (Technical or engineered material use); USES (Uses)

(**water-sol.**, SMA 17352; prepn. of textile spot and stain remover comprising)

IT 151-21-3, Sodium lauryl sulphate, uses

RL: MOA (Modifier or additive use); TEM (Technical or engineered material use); USES (Uses)

(anionic **surfactant**; prepn. of textile spot and stain remover comprising)

IT 1313-60-6, Sodium peroxide 3313-92-6, Sodium percarbonate

**7722-84-1, Hydrogen peroxide**, uses

7775-27-1, Sodium persulfate 15630-89-4 18278-90-5, Sodium peroxydiphosphate

RL: MOA (Modifier or additive use); TEM (Technical or engineered material use); USES (Uses)

(oxidant; prepn. of textile spot and stain remover comprising)

IT 60800-81-9, SMA 17352

RL: MOA (Modifier or additive use); TEM (Technical or engineered material use); USES (Uses)

(**water-sol.** polymer; prepn. of textile spot and stain remover comprising)

IT **7722-84-1, Hydrogen peroxide**, uses

RL: MOA (Modifier or additive use); TEM (Technical or engineered material use); USES (Uses)

(oxidant; prepn. of textile spot and stain remover comprising)

L41 ANSWER 2 OF 11 HCA COPYRIGHT 2003 ACS on STN

127:102570 Particle deposition and removal in wet **cleaning** processes for semiconductor manufacturing. Itano, M.; Kezuka, T.; Kubo, M.; Ohmi, T. (DAIKIN INDUSTRIES LTD., Settsu, Japan). Semiconductor Pure Water and Chemicals Conference, 15th (UPW & Chemical Proceedings, 1996), 257-287 (English) 1996. CODEN: SPWCFI. Publisher: Balazs Analytical Laboratory.

AB It is demonstrated that the room temp. **NH4OH-H2O2-**

**H2O** soln. has almost the same ability to remove particles as the high temp. **NH4OH-H2O2-H2O** soln. This was

achieved by increasing the **NH4OH** content in the **NH4OH-H2O2-H2O** to around the ratio of 2:1:5 to 10:1:5. In

addn., the dild. HF soln. with an anionic **surfactant** is essentials to maintain sufficient particle removal efficiency in the room

- temp. **NH4OH-H2O2-H2O cleaning**  
process.
- CC 76-3 (Electric Phenomena)
- ST particle removal wet **cleaning** semiconductor manufg;  
**ammonium hydroxide** wet **cleaning** semiconductor  
manufg; **hydrogen peroxide** wet **cleaning**  
semiconductor manufg
- IT **Cleaning**  
Particles  
Semiconductor materials  
(particle deposition and removal in wet **cleaning** with  
**NH4OH-H2O2-H2O** soln. for semiconductor  
manufg.)
- IT 1336-21-6, **Ammonium hydroxide**  
7722-84-1, **Hydrogen peroxide**, uses  
RL: NUU (Other use, unclassified); USES (Uses)  
(particle deposition and removal in wet **cleaning** with  
**NH4OH-H2O2-H2O** soln. for semiconductor  
manufg.)
- IT 1336-21-6, **Ammonium hydroxide**  
7722-84-1, **Hydrogen peroxide**, uses  
RL: NUU (Other use, unclassified); USES (Uses)  
(particle deposition and removal in wet **cleaning** with  
**NH4OH-H2O2-H2O** soln. for semiconductor  
manufg.)
- L41 ANSWER 3 OF 11 HCA COPYRIGHT 2003 ACS on STN
- 123:290419 SC-1 **cleaning** with low surface-tension ammonia  
**water**. Mori, Kiyota; Ishikawa, Norio; Shihoya, Takao; Yamashita,  
Asaaki (Kanto Chemical Co., Inc., Japan). Semiconductor Pure Water and  
Chemicals Conference, 12th, 122-43 (English) 1993. CODEN:  
SPWCFI. ISSN: 1521-4656.
- AB A discussion of effectiveness of **cleaning** solns. contg. ammonia  
**water**, **H2O2**, and deionized **water**; the soln. is  
used to remove dust, polystyrene latex, and silica.
- CC 46-3 (Surface Active Agents and Detergents)
- ST ammonia **hydrogen peroxide cleaning** soln
- IT **Detergents**  
(**cleaning** compns., effectiveness of SC-1 **cleaning**  
soln. contg. ammonia **water** and **hydrogen**  
**peroxide**)
- IT 1336-21-6, **Ammonium hydroxide**  
7722-84-1, **Hydrogen peroxide**, uses  
RL: NUU (Other use, unclassified); PRP (Properties); USES (Uses)  
(effectiveness of SC-1 **cleaning** soln. contg. ammonia  
**water** and **hydrogen peroxide**)
- IT 1336-21-6, **Ammonium hydroxide**  
7722-84-1, **Hydrogen peroxide**, uses  
RL: NUU (Other use, unclassified); PRP (Properties); USES (Uses)  
(effectiveness of SC-1 **cleaning** soln. contg. ammonia  
**water** and **hydrogen peroxide**)
- L41 ANSWER 4 OF 11 HCA COPYRIGHT 2003 ACS on STN
- 116:217395 .eta.leanings of silicon plates. Jankech, Dominik; Haban, Ivan;  
Drgac, Lubomir (Czech.). Czech. CS 270880 B1 19910704, 2 pp.  
(Slovak). CODEN: CZXXA9. APPLICATION: CS 1988-8807 19881227.
- AB Si plates are **cleaned** by covering with a soln. consisting of  
deionized **water** 4-7, **NH4OH** 1, **H2O2** 1 part,  
and **surfactant** 0.01-4 wt.%, and subsequent exposure to  
ultrasound at 0.2-1.2 MHz. The **cleaning** procedure is rapid and



provides complete removal of chem. and mech. impurities. Typically, a soln. consisting of deionized **water** 5, **NH4OH** 1, **H2O2** 1 part, and **surfactant** 0.1% is used with ultrasound at 0.7 MHz.

IC ICM C23G005-00

CC 49-1 (Industrial Inorganic Chemicals)

ST silicon plate **cleaning** soln ultrasound

IT Sound and Ultrasound

(**cleaning** by, of silicon plates covered by treatment soln.)

IT **Surfactants**

(**cleaning** soln. contg., for ultrasonic treatment of silicon plates)

IT 7440-21-3, Silicon, uses

RL: USES (Uses)

(**cleaning** of plates of, soln. and ultrasonic treatment for)

IT 1336-21-6, Ammonium hydroxide

7722-84-1, Hydrogen peroxide, uses

RL: USES (Uses)

(**cleaning** soln. contg., for ultrasonic treatment of silicon plates)

IT 1336-21-6, Ammonium hydroxide

7722-84-1, Hydrogen peroxide, uses

RL: USES (Uses)

(**cleaning** soln. contg., for ultrasonic treatment of silicon plates)

L41 ANSWER 5 OF 11 HCA COPYRIGHT 2003 ACS on STN

113:134693 Manufacture of alkaline salts of maleic anhydride copolymers..

Klopotek, Alojzy; Jaroszewska, Maria (Instytut Chemii Przemyslowej, Pol.).

Pol. PL 145180 B1 **19880831**, 9 pp. Abstracted and indexed from the unexamined application. (Polish). CODEN: POXXA7. APPLICATION: PL 1984-249200 19840815.

AB Prepn. of the title salts involves (1) copolymerization in a **water**-sol.

solvent in the presence of 0.5-5 wt.% **H2O2** initiator at

35-80.degree. and maleic anhydride (I)/vinyl monomer mol ratio of 1:(1-50)

and (2) treating the copolymers (or their 10-40% solns.) with an alkali

metal hydroxide, **NH4OH**, or ethanolamine. Thus, a mixt. of

acetone 100 mL, styrene  $1.38 \times 10^{-1}$  mol, I  $1.38 \times 10^{-1}$  mol, and

**H2O2**  $2.5 \times 10^{-2}$  mol was boiled 3 h at 56.1.degree.. After

copolymerization, the mixt. was cooled to 20-25.degree., the copolymer was dild.

with acetone at 1:3 ration, and poured into **water** at 15.degree.

and copolymer-**water** wt. ratio 1:5. The ppt. was sepd. by

filtration, washed with **H2O**, and dried to give 27 g maleic

anhydride-styrene copolymer (acid no. 554) at a yield of 97%. The powd.

copolymer was contacted with 10.684 g NaOH (in the form of 10% soln.) at

70.degree. to obtain 26.3 wt% soln of Na salt, which was dried to give 35

g solid (yield 99%).

IC ICM C08F222-08

ICS C08F212-08

CC 46-6 (Surface Active Agents and Detergents)

Section cross-reference(s): 35

ST maleic anhydride copolymer alk salt; styrene maleic salt copolymer;

**cleaning** maleic salt copolymer

IT **Detergents**

(**cleaning** compns., maleic anhydride-vinyl compd. copolymer

salts for, prepn. of)

IT 25736-61-2P, Maleic anhydride-styrene copolymer sodium salt 52002-63-8P

98202-34-7P 129426-96-6P

RL: IMF (Industrial manufacture); PREP (Preparation)

(prepn. of, for washing and **cleaning** agents)

- L41 ANSWER 6 OF 11 HCA COPYRIGHT 2003 ACS on STN  
112:201177 Carpet **cleaning** composition containing alcohol and peroxyhydrate. Minns, Charles Randolph (BASF Corp., USA). Eur. Pat. Appl. EP 346835 A2 **19891220**, 6 pp. DESIGNATED STATES: R: AT, BE, CH, DE, ES, FR, GB, GR, IT, LI, LU, NL, SE. (English). CODEN: EPXXDW. APPLICATION: EP 1989-110696 19890613. PRIORITY: US 1988-206531 19880614.
- AB Aq. **cleaning** compns. contg. a C1-5 alc. and a peroxyhydrate such as H2O2 and having pH 7-12 are useful for removing soils and/or stains, esp. coffee stains, from synthetic polymer fibers, esp. carpet fibers. A mixt. of iso-PrOH 10, 30% aq. H2O2 30, **water** 50, and NH4OH 10% was sprayed on nylon, polyester, and polypropene carpets contg. black coffee stains and allowed to stand 1 h, giving complete stain removal.
- IC ICM C11D003-00  
ICS C11D007-50; C11D007-38; C11D007-06
- CC 46-6 (Surface Active Agents and Detergents)
- ST alc stain remover carpet; peroxide stain remover carpet; **cleaner** alc peroxide carpet; coffee stain remover carpet; nylon carpet stain remover; polyester carpet stain remover; polypropene carpet stain remover; isopropyl alc stain remover carpet; bleaching peroxide stain carpet
- IT Carpets  
(**cleaners** contg. alc. and peroxyhydrate for stained)
- IT Peroxides, uses and miscellaneous  
RL: USES (Uses)  
(**cleaners** contg. alcs. and, for stained carpets)
- IT Bleaching agents  
(peroxide, **cleaners** contg. alcs. and, for stained carpets)
- IT Alcohols, uses and miscellaneous  
RL: USES (Uses)  
(C1-5, **cleaners** contg. peroxide and, for stained carpets)
- IT **Detergents**  
(**cleaning** compns., alc.- and peroxide-contg., for stained carpets)
- IT 124-43-6 1313-60-6, Sodium peroxide (Na2(O2)) 7775-27-1, Sodium persulfate 10332-33-9, Sodium perborate monohydrate 10486-00-7, Sodium perborate tetrahydrate 15593-49-4, Potassium peroxydiphosphate 15630-89-4, Sodium percarbonate 17014-71-0, Potassium peroxide 18278-90-5, Sodium peroxydiphosphate 66904-11-8 127030-48-2  
RL: USES (Uses)  
(**cleaners** contg. alcs. and, for stained carpets)
- IT 64-17-5, Ethanol, uses and miscellaneous 67-56-1, Methanol, uses and miscellaneous 67-63-0, 2-Propanol, uses and miscellaneous 71-23-8, 1-Propanol, uses and miscellaneous 71-36-3, 1-Butanol, uses and miscellaneous 75-85-4, tert-Pentyl alcohol 78-83-1, Isobutyl alcohol, uses and miscellaneous 78-92-2, 2-Butanol  
RL: USES (Uses)  
(**cleaners** contg. peroxide and, for stained carpets)
- L41 ANSWER 7 OF 11 HCA COPYRIGHT 2003 ACS on STN  
74:44879 Compositions for **cleaning** and removing copper from metallic surfaces. Moeller, Fritz; Groschopp, Heinz; Wagenknecht, Rudolf (Collardin, Gerhard, G.m.b.H.). Ger. DE 1289720 **19690220**, 4 pp. (German). CODEN: GWXXAW. APPLICATION: DE 1964-H51404 19640116.
- AB Gun bores are **cleaned** with a compn. consisting preferably of 800 cm3 NH3 soln. (25%), 100 g melamine perhydrate (20% H2O2), 8 g CM-cellulose, and 200 cm3 H2O with a **wetting agent**. Simultaneous removal of Cu and gun powder residues without base metal attack and pollution problems is claimed.

- IC C23G  
CC 56 (Nonferrous Metals and Alloys)  
ST **cleaning** copper stripping solns; copper stripping  
**cleaning** solns; stripping copper **cleaning** solns; ammonia  
**cleaning** copper stripping solns; peroxides **cleaning**  
copper stripping solns; melamine perhydrate copper stripping  
**cleaning**; perhydrate melamine copper stripping **cleaning**
- IT 33676-69-6  
RL: USES (Uses)  
(**cleaning** with, of copper from gun barrels)
- IT 109-89-7, uses and miscellaneous 110-86-1, uses and miscellaneous  
**1336-21-6** 7727-21-1 7727-54-0 9000-11-7 9004-67-5  
11067-82-6  
RL: USES (Uses)  
(**cleaning** with, of copper, from gun barrels)
- IT **1336-21-6**  
RL: USES (Uses)  
(**cleaning** with, of copper, from gun barrels)
- L41 ANSWER 8 OF 11 HCA COPYRIGHT 2003 ACS on STN  
65:2700 Original Reference No. 65:447c-d Surface preparation of magnesium  
molds for plastics. MacCaffray, Rex S., Jr.; Hankins, Kenneth E. (C. H.  
Masland & Sons). US 3248825 **19660503**, 3 pp. (Unavailable).  
APPLICATION: US 19640113.
- AB Such molds, commonly made of an alloy contg. at least 95% Mg, are finished  
by chem. etching. The molds are **scrubbed** with a slurry of MgO,  
CaCO<sub>3</sub>, or preferably ZnO particles of .apprx.1-.mu. size or finer in an  
alk. soap soln. to produce a desirably uniform surface, free from shiny  
areas that result in blotchiness of the casting surfaces. Any cold  
liquid, such as H<sub>2</sub>O or alc., can be used, and the shiny spots  
are eliminated more quickly if the slurry contains 0.2-5% 50-100 .mu. hard  
carbide particles by wt. of solids. The application can be made with a  
small **scrubbing** brush, preferably nylon, using 5-15 lb.  
pressure. Phosphate **detergents** should not be used, ordinary  
laundry soap being preferable.
- NCL 051281000  
CC 20 (Nonferrous Metals and Alloys)  
IT **1336-21-6, Ammonium hydroxide**  
(in etching soln. for Ag and Ag alloys)  
IT **7722-84-1, Hydrogen peroxide**  
(in etching solns. for Ag and Ag alloys)  
IT **1336-21-6, Ammonium hydroxide**  
(in etching soln. for Ag and Ag alloys)  
IT **7722-84-1, Hydrogen peroxide**  
(in etching solns. for Ag and Ag alloys)
- L41 ANSWER 9 OF 11 HCA COPYRIGHT 2003 ACS on STN  
53:69980 Original Reference No. 53:12695c-e Copolymers of vinyl lactams and  
trimethallyl isocyanurate. Davis, Clyde W.; Ehlers, Forrest A. (Dow  
Chemical Co.). US 2848440 **19580819** (Unavailable). APPLICATION:  
US .
- AB Dye-receptive, **water**-insol. copolymers of vinylpyrrolidinone (I)  
and trimethallyl isocyanurate (II) were prepd. by dissolving 20.0 g. I and  
2.0 g. II in 45 ml. **water**, contg. 0.28 ml. 28% aq. **NH<sub>4</sub>OH**  
and 1.8 ml. 5% aq. **H<sub>2</sub>O<sub>2</sub>**, and heating at 50.degree. for 16 hrs.  
without agitation. The white, gel-like product was dried in vacuo and  
then washed with **water** in a Soxhlet app. to recover 56.5% by wt.  
copolymer based on monomer charge. The **water**-insol. copolymer  
was ball-milled and 10% by wt. added to a polyacrylonitrile spinning soln.  
The resultant fibers had excellent dyeability with Calcodur Pink 2 BL.

The fiber did not lose significant amts. of the impregnated copolymer upon **scouring** in a boiling concd. aq. soln. of a **detergent**.

CC 25 (Dyes and Textiles Chemistry)

L41 ANSWER 10 OF 11 HCA COPYRIGHT 2003 ACS on STN

41:28593 Original Reference No. 41:5746c-i,5747a-c Investigation of various types of peroxides as initiators of emulsion polymerization. Yurzhenko, T. I.; Gromova, G. N.; Khaitser, V. B. Zhurnal Obshchei Khimii, 16, 1505-20 (Unavailable) 1946. CODEN: ZOKHA4. ISSN: 0044-460X.

AB **Detns.** of the distribution between **water** and org. solvents, catalysis of the polymerization of 1,3-butadiene, stability, and effect on the properties of the polymer obtained, were made on 6 inorg. and org. peroxides: trimethylcarbinol hydroperoxide (I); dimethylethylcarbinol hydroperoxide (II); NaBO<sub>3</sub> (9.98% active O) (III); Bz<sub>2</sub>O<sub>2</sub> (IV); K<sub>2</sub>S<sub>2</sub>O<sub>8</sub> (V); and H<sub>2</sub>O<sub>2</sub> (3-5% aq. soln.) (VI). Distribution coeffs. between **water** and C<sub>6</sub>H<sub>6</sub>, **water** and isoprene, and 1.5% aq. NaOH and isoprene, were detd. for I, III, IV, V, VI, at 25 and 60.degree.. The content of the **water**-sol. peroxides in the org. phase was almost const. with time but fell rapidly in the aq. phase, particularly at higher temp. The soly. of IV decreased with time in the org. phase, but increased in **water**; I was almost equally distributed between **water** and the org. phase at 25.degree., increasing somewhat in the latter at 60.degree.. From measurements on the rate of polymerization in the presence of an amt. of peroxide equiv. to 0.1% active O (with respect to C<sub>4</sub>H<sub>6</sub>), with a 3% soln. of Na oleate (with a 0.32 N excess Na<sub>2</sub>CO<sub>3</sub>) as **emulsifier**, phase ratio 1:1, at 60.degree., from readings of the contraction of the liquid, the order of decreasing catalytic activity was: I (depth of polymerization s = 60% reached in 8 hrs.), V (s = 60% in 26 hrs.), IV (s = 20% in 36 hrs.), III and VI (s = 0.0% in 38 hrs.). At 40.degree., only the tertiary alcs. of the I and II type were active; no polymerization occurred with any other peroxide; with I, s = 40 was attained in 10 hrs., with II in 16 hrs. From **detns.** of the rate of decompn. in both **water** and in the above 3% Na oleate soln. (IV in C<sub>6</sub>H<sub>6</sub>), the stability decreased in the order: I (unimol. rate const. k, in min., = 0.000671 at 60.degree.), V (k = 0.00125), IV (k = 0.00196), III and VI (k = 0.238 and 0.360; decompn. complete in 10-15 min. in 1-1.5% soln.). Addn. of 0.32 N Na<sub>2</sub>CO<sub>3</sub> accelerated the rate of decompn. of VI most markedly, NaOH somewhat less, **NH<sub>4</sub>OH** least; the effect was strongly enhanced in a 3% Na oleate soln. In the same medium, the rate of decompn. of the highly stable peroxides (such as I) was much lower than the rate of polymerization; for peroxides of medium stability (such as V) decompn. was faster than polymerization, for the low-stability IV, much faster. For the least stable III and VI, polymerization of isoprene was found to lag after decompn. to such an extent that polymerization practically only started when decompn. was nearly complete; in this case the peroxides undoubtedly are only active through mol. O. In contrast, the catalytic action of peroxides of type V, characterized by the closeness of the rate curves of decompn. and polymerization, evidently is due to at. O, whereas catalysis by the highly stable tertiary alcs. (I, II) proceeds over the radicals Me<sub>3</sub>C and OOH. Variation of the concn. of I, at 40 and 50.degree., from 0.01 to 0.1% active O increased the rate of polymerization of C<sub>4</sub>H<sub>6</sub>; further increase resulted in a decrease of the rate; at 60.degree., the max. lay at 0.05% active O. Concurrently, **detns.** of the surface adsorption isotherm at 25.degree., from measurements of the surface tension, showed satn. of the surface layer of I on **water** to be attained at a concn. corresponding to 0.135% active O; hence the max. is interpreted in terms of satn. of the adsorption layer at the phase boundary. On further increasing the amt. of the peroxide, its concn. in the bulk of the aq. phase increased rapidly,

promoting rupture of reaction chains; hence the observed fall of the rate of polymerization. At const. concn. of I, the soly. of the polymer produced in C<sub>2</sub>H<sub>4</sub>Cl<sub>2</sub> (after 24 hrs.) decreased from 77.0 to 18.1%, with s increasing from 15.2 to 73.5%. Variation of the concn. of I (0.01, 0.10, 0.15, 0.60% active O), gave s of 41.0, 40.5, 60.2 (max.), 18.6; soly. 27.0, 85.0, 100, 100; mol. wt. (Staudinger) 11,000, 23,000, 37,000 (max.), 9000, resp.; the swelling ability varied in the same way as the mol. wt.. This corroborates the hypothesis of rupture of chains by the peroxide.

CC 30 (Rubber and Other Elastomers)

IT Peroxides

(as catalysts, in polymerization of butadiene and isodiene and isoprene and distribution between **water** and solvents)

IT Catalysts

(in polymerization, of butadiene and isoprene, peroxides as, and their distribution between **water** and solvents)

IT Partition

(of peroxide catalysts for polymerization between **water** and solvents)

IT Adsorption

(of peroxide catalysts on surface of **water** and solvents)

IT Sodium perborate

(as catalyst in polymerization of butadiene and isoprene and distribution between **water** and solvents)

IT 75-91-2, tert-Butyl hydroperoxide

(as catalyst in polymerization and its distribution between **water** and solvents)

IT 94-36-0, Benzoyl peroxide **7722-84-1, Hydrogen peroxide** 7727-21-1, Potassium peroxydisulfate

(as catalyst in polymerization of butadiene and isoprene and distribution between **water** and solvents)

IT 78-79-5, Isoprene

(polymerization of, with peroxide catalysts and peroxide catalyst distribution between **water** and isoprene)

IT **7722-84-1, Hydrogen peroxide**

(as catalyst in polymerization of butadiene and isoprene and distribution between **water** and solvents)

L41 ANSWER 11 OF 11 HCA COPYRIGHT 2003 ACS on STN

36:34572 Original Reference No. 36:5381a-i The estimation of small percentages of rubber in fibrous materials. Blow, C. M. India Rubber Journal, 102, 719-22 (Unavailable) 1942. CODEN: IRJOAO. ISSN: 0367-9985.

AB Four general methods for sepg. unvulcanized or vulcanized rubber from vegetable and animal fibers are discussed, both with respect to known facts and to exptl. investigations of these methods by B. (1) the use of solvents to remove rubber without affecting the fiber (in this case the % ext. or loss in wt. is measured); (2) destruction of the fiber by a chem. reagent which does not affect the rubber; (3) oxidation, or other chem. alteration of the rubber to render it more easily removable from the fiber by extn. with a solvent or by emulsification with a **detergent**; (4) the quant. reaction of a chem. reagent with the rubber. In addn. to the conventional caustic treatment in method (2), it was found that a promising method is to treat 1-2 g. of material with boiling concd. HCl, decant through a sintered-glass or alundum crucible, agitate the slurry of degraded fiber and rubber with 50 cc. of **water** and 10 cc. of benzene, sep. the 2 layers, ppt. the rubber from the benzene by acetone, filter and weigh. A little oil-sol. dye in the benzene sometimes makes the sepn. easier. Oxidized rubber is sol. in acetone and is not included in the result. Method (3) has not been studied heretofore. Three steps are necessary: (a) treatment with an oxidation catalyst, e. g., Co or Cu

naphthenate, linoleate or stearate in CCl<sub>4</sub> or benzene or emulsified in NH<sub>4</sub>OH (1-2% of catalyst by wt. of the sample); (b) oxidation of the finely divided sample by heating 1-2 hrs. in air at 70.degree. or by steeping in excess H<sub>2</sub>O<sub>2</sub> at 50-60.degree. for 15-30 min., filtering and evapg., and (c) sepn. of the fiber from the oxidized rubber either by removing the latter by boiling 1-2% aq. NaOH or Na<sub>2</sub>CO<sub>3</sub>, with or without Na oleate, and collecting, washing, drying and weighing the fiber, or extg. the oxidized rubber with acetone and weighing the dried residual fiber or dried ext. Ordinarily it is preferable to weigh the fiber (controlling its moisture content), since the rubber contains an indefinite percentage of O. Blank detns. showed that with Co linoleate and H<sub>2</sub>O<sub>2</sub>, cellulose loses 2% by wt. in boiling aq. NaOH. This fact is in favor of acetone extn. of the oxidized rubber. The only promising technique in method (4) seemed to be to dry the finely divided sample at 80-100.degree., immerse 1 g. in 50-100 cc. of a CCl<sub>4</sub> soln. of Br contg. 50% more Br than the calcd. amt., add. aq. KI after 30-120 min., and titrate the liberated I with Na<sub>2</sub>S<sub>2</sub>O<sub>3</sub>. However, this procedure did not give reliable results with rubberized wool fabric. Certain general recommendations are made for sepg. rubber and fibrous materials. The sample should be finely ground or cut, and first of all extd. with acetone to remove oils, fats, waxes, org. dyes and oxidized rubber. When a soap-and-soda scour or NaOH treatment is included in the procedure, extn. with aq. NaOH also is necessary to remove proteins, soaps, sol. coagulants, starches, etc. In methods involving destruction of the rubber, sepn. of fiber from emulsified oxidized rubber is sometimes difficult, and it is of advantage to centrifuge the soln., wash the sepd. fiber, filter through a Gooch crucible, dry and weigh. Its purity is detd. by detg. its ash. When the oxidized rubber is estd. by acetone extn., the fiber can be filtered directly into a paper thimble. In methods involving destruction of the fiber, acetone-insol. and water-insol. components are detd. as rubber, and therefore the purity of the rubber should be checked by detg. its ash, and a correction for the Co or Cu salt added must be made. Typical analyses of rubberized wool yarn, leather board, rubberized cotton yarn, cellulose board and imitation leather are included.

CC 30 (Rubber and Allied Substances)

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FYI, these dates are not going to be any good for you.

\*\*\*\*\*

=> d L39 1-3 cbib abs hitind hitrn

L39 ANSWER 1 OF 3 HCA COPYRIGHT 2003 ACS on STN  
139:172150 **Cleaning** solution for substrate surfaces and  
**cleaning** method. Morinaga, Hitoshi; Mochizuki, Hideaki; Ito,  
Atsushi (Mitsubishi Chemical Corp., Japan). Jpn. Kokai Tokkyo Koho JP  
2003221600 A2 20030808, 13 pp. (Japanese). CODEN: JKXXAF. APPLICATION:  
JP 2002-331915 20021115. PRIORITY: JP 2001-350947 20011116.

AB Title soln. comprise (A) **ethylene** oxide adduct type  
**surfactants** having **polyoxyethylene** groups and  
(substituted)hydrocarbon groups, (B) alkali components, (C) 0.01-4%  
**hydrogen peroxide**, and (D) **water**, wherein the  
ratio (m/n) of no. of carbon in hydrocarbon groups (m) and no. of  
**oxyethylene** group (n) in **polyoxyethylene** groups in  
**surfactants** is .ltoreq.1.5. Thus, a **cleaning** soln. with

- pH 10.5 comprising 33 ppm **polyethylene glycol monododecyl ether** with m/n 1.1, **ammonium hydroxide**, 1.4% **hydrogen peroxide**, and **water** showed good **cleaning** against contaminated silicon wafers.
- IC ICM C11D017-08  
ICS B08B003-08; B08B003-10; B08B003-12; C11D001-722; C11D003-26;  
C11D003-39; H01L021-304
- CC 76-3 (Electric Phenomena)
- ST **cleaning** soln substrate surface; **polyethylene glycol alkyl ether hydrogen peroxide ammonium hydroxide** compn
- IT **Cleaning**  
Detergents  
Surfactants  
(**cleaning** soln. for substrate surfaces and **cleaning** method)
- IT Alkali metal hydroxides  
RL: REM (Removal or disposal); PROC (Process)  
(**cleaning** soln. for substrate surfaces and **cleaning** method)
- IT Quaternary ammonium compounds, uses  
RL: TEM (Technical or engineered material use); USES (Uses)  
(hydroxide; **cleaning** soln. for substrate surfaces and **cleaning** method)
- IT 1336-21-6, **Ammonium hydroxide**  
7722-84-1, **Hydrogen peroxide**, uses  
RL: TEM (Technical or engineered material use); USES (Uses)  
(**cleaning** soln. for substrate surfaces and **cleaning** method)
- IT 7440-21-3, **Silicon**, processes  
RL: PEP (Physical, engineering or chemical process); PYP (Physical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)  
(substrate; **cleaning** soln. for substrate surfaces and **cleaning** method)
- IT 9002-92-0, **Polyethylene glycol monododecyl ether**  
9004-95-9, **Polyethylene glycol hexadecyl ether**  
9005-00-9, **Polyethylene glycol octadecyl ether**  
24938-91-8, **Polyethylene glycol tridecyl ether**  
27252-75-1, **Polyethylene glycol octyl ether**  
RL: TEM (Technical or engineered material use); USES (Uses)  
(**surfactant**; **cleaning** soln. for substrate surfaces and **cleaning** method)
- IT 1336-21-6, **Ammonium hydroxide**  
7722-84-1, **Hydrogen peroxide**, uses  
RL: TEM (Technical or engineered material use); USES (Uses)  
(**cleaning** soln. for substrate surfaces and **cleaning** method)
- L39 ANSWER 2 OF 3 HCA COPYRIGHT 2003 ACS on STN  
137:378790 Method for **cleaning** surface of substrates for display devices. Morinaga, Hitoshi; Mochizuki, Hideaki (Mitsubishi Chemical Corporation, Japan). PCT Int. Appl. WO 2002094462 A1 20021128, 39 pp.  
DESIGNATED STATES: W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, KE, KG, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM; RW: AT, BE, BF, BJ, CF, CG, CH, CI, CM, CY, DE, DK, ES, FI, FR, GA, GB, GR, IE, IT, LU, MC, ML, MR,

NE, NL, PT, SE, SN, TD, TG, TR. (Japanese). CODEN: PIXXD2. APPLICATION:  
WO 2002-JP4850 20020520. PRIORITY: JP 2001-151960 20010522.

- AB A method for **cleaning** the surface of a substrate includes: (1) a step of washing the surface of a substrate with an alk. **cleaning** agent contg. a complexing agent, and (2) a step of washing the surface with a **cleaning** agent contg. HF in a content (C wt. %) of 0.03 to 3% with a washing time (t seconds) of .ltoreq.45 s, provided that C and t satisfy the relation:  $0.25 \cdot \text{ltoreq. } t \leq 1.29 \cdot \text{ltoreq. } 5$ , wherein the step (2) is carried out after the step (1). The method provides a highly efficient washing of a substrate, wherein (a) the substrate can be washed in a short time, (b) both particle contaminants and metal contaminants can be removed, and (c) the occurrence of a problem assocd. with the washing of a substrate such as re-deposition of the contaminants or the dimensional change of a processed substrate through etching is remarkably reduced.
- IC ICM B08B003-08  
CC 76-3 (Electric Phenomena)  
Section cross-reference(s): 74
- ST **cleaning** washing surface substrate hydrogen chloride; display device substrate surface **cleaning**
- IT **Cleaning**  
Electrooptical imaging devices  
**Surfactants**  
Washing  
(**cleaning** of substrate surface in manuf. of semiconductor devices)
- IT 7440-21-3, Silicon, processes  
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process); USES (Uses)  
(**cleaning** of substrate surface in manuf. of semiconductor devices)
- IT 60-00-4, uses 1170-02-1 7732-18-5, **Water**, uses 84677-62-3  
RL: NUU (Other use, unclassified); USES (Uses)  
(**cleaning** of substrate surface in manuf. of semiconductor devices)
- IT 1336-21-6, **Ammonium hydroxide** 7664-39-3, Hydrogen fluoride, reactions 7722-84-1, **Hydrogen peroxide**, reactions  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(**cleaning** of substrate surface in manuf. of semiconductor devices)
- IT 12033-89-5, Silicon nitride, processes  
RL: REM (Removal or disposal); PROC (Process)  
(particle; particle removal in **cleaning** of substrate surface for semiconductor devices)
- IT 1330-69-4, Dodecylbenzene sulfonate  
RL: NUU (Other use, unclassified); USES (Uses)  
(**surfactant; cleaning** of substrate surface for semiconductor devices)
- IT 9002-92-0, **Polyethylene glycol monododecyl ether**  
9004-98-2, **Polyethylene glycol monooleyl ether**  
27176-87-0, Dodecylbenzenesulfonic acid  
RL: NUU (Other use, unclassified); USES (Uses)  
(**surfactant; cleaning** of substrate surface in manuf. of semiconductor devices)
- IT 7732-18-5, **Water**, uses  
RL: NUU (Other use, unclassified); USES (Uses)  
(**cleaning** of substrate surface in manuf. of semiconductor devices)



- IT 1336-21-6, **Ammonium hydroxide**  
7722-84-1, **Hydrogen peroxide**, reactions  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(**cleaning** of substrate surface in manuf. of semiconductor devices)
- L39 ANSWER 3 OF 3 HCA COPYRIGHT 2003 ACS on STN  
136:127113 Particle removal and its mechanism on hydrophobic silicon wafer in highly diluted **NH4OH** solutions with an added **surfactant**  
. Park, Jin-Goo; Lee, Sang-Ho; Kim, Sang-Yong (Department of Metallurgy and Materials Engineering, Hanyang University, Ansan, 425-791, S. Korea). Japanese Journal of Applied Physics, Part 1: Regular Papers, Short Notes & Review Papers, 40(11), 6182-6186 (English) 2001. CODEN: JAPNDE. Publisher: Japan Society of Applied Physics.
- AB Wafer **cleaning** in semiconductor processes is one of the most crit. steps because of the rapid increase in the device integration d. and its direct impact on device yield. Highly dild. **NH4OH** solns. to which a nonionic polyoxy-alkylene alkylphenyl **ether surfactant** was added were evaluated to measure their **cleaning** efficiency and to det. the particle removal mechanism. The particle removal expt. was performed in a 0.2 vol% **NH4OH** soln., which has a pH value equiv. to that of conventional SC1 (1:1:5, **NH4OH:H2O2:H2O** mixt.) soln., as a function of soln. temp. A **surfactant** of crit. micelle concn. of 50 ppm was added to the **NH4OH** soln. The etch rate of silicon in 0.2 vol% **NH4OH** soln. decreased to 2.4 .ANG./min from 92 .ANG./min at 80.degree. by the addn. of the **surfactant** due to the adsorption of the **surfactant** on the surface. The particle removal efficiency increased as the temp. of the solns. increased. A particle removal of over 95% was obsd. when wafers were treated in **surfactant**-added **NH4OH** soln. at 80.degree.. This can most likely be attributed to the slight increase of the etch rate and better passivation of the **surfactant** on the silicon surface at a higher temp.
- CC 76-3 (Electric Phenomena)  
ST semiconductor wafer **cleaning ammonium hydroxide**  
IT Particles  
**Surfactants**  
(particle removal and its mechanism on hydrophobic silicon wafer in highly dild. **NH4OH** solns. with added **surfactant**)
- IT **Cleaning**  
(particle removal and its mechanism on hydrophobic silicon wafer in highly dild. **NH4OH** solns. with an added **surfactant**)
- IT 1336-21-6, **Ammonium hydroxide**  
RL: NUU (Other use, unclassified); USES (Uses)  
(particle removal and its mechanism on hydrophobic silicon wafer in highly dild. **NH4OH** solns. with added **surfactant**)
- IT 7440-21-3, Silicon, processes  
RL: PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process)  
(wafers; particle removal and its mechanism on hydrophobic silicon wafer in highly dild. **NH4OH** solns. with added **surfactant**)
- IT 1336-21-6, **Ammonium hydroxide**  
RL: NUU (Other use, unclassified); USES (Uses)  
(particle removal and its mechanism on hydrophobic silicon wafer in highly dild. **NH4OH** solns. with added **surfactant**)

\*\*\*\*\*

I didn't date limit the answers in Japio or Derwent. Derwent makes it almost impossible, it takes a very long time. Also I tried to take out duplicates, but I would imagine some duplicates remain.

\*\*\*\*\*

=> file japio

FILE 'JAPIO' ENTERED AT 15:50:58 ON 24 SEP 2003  
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FILE LAST UPDATED: 2 SEP 2003 <20030902/UP>  
FILE COVERS APR 1973 TO MAY 30, 2003

<<< GRAPHIC IMAGES AVAILABLE >>>

=> d L87 1-15 ibib abs ind

L87 ANSWER 1 OF 15 JAPIO (C) 2003 JPO on STN  
ACCESSION NUMBER: 2002-025964 JAPIO  
TITLE: METHOD OF MANUFACTURING SEMICONDUCTOR DEVICE  
INVENTOR: HARA KOJI; TAKAHARA YOICHI; SAEKI TOMONORI; TOMIOKA  
HIDEKI; ITO MASAKI; TSUGANE MASARU; ITO HARUO;  
FUNAHASHI TOMOMASA  
PATENT ASSIGNEE(S): HITACHI LTD  
PATENT INFORMATION:

PATENT NO	KIND	DATE	ERA	MAIN IPC
JP 2002025964	A	20020125	Heisei	H01L021-304

APPLICATION INFORMATION

STN FORMAT:	JP 2000-206828	20000704
ORIGINAL:	JP2000206828	Heisei
PRIORITY APPLN. INFO.:	JP 2000-206828	20000704

SOURCE: PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined  
Applications, Vol. 2002

AN 2002-025964 JAPIO

AB PROBLEM TO BE SOLVED: To protect electrodes or wirings formed of high-melting metal nitride against etching at **cleaning** after the electrodes or wirings are formed in the manufacture of a semiconductor **device** provided with the electrodes or wirings formed of high-melting metal nitride.

**SOLUTION:** A semiconductor **device** manufacturing method comprises a first process of forming conductor films that contain high-melting point nitride films on a semiconductor **substrate**, a second process of patterning the conductor films into required forms, and a third process of **cleaning** the patterned conductor films. A **cleaning solution** used in the third process of **cleaning** the patterned conductor films is a mixed **solution** of quaternary **ammonium hydroxide** represented by general formula,  $[(R_1)_nN(R)_{4-n}]^+OH^-$  ( $R_1$  is a 1-2C alkyl group, R is a 1-2C alkyl group or a 1-2C hydroxy-substituted alkyl group, and  $R_1$  and R may be identical to each other or different from each other. n is an integer of 1 to 3), a **hydrogen peroxide solution**, and

pure water.

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IC ICM H01L021-304

ICS H01L021-28; H01L021-3213; H01L021-3205; H01L029-43; H01L029-78

L87 ANSWER 2 OF 15 JAPIO (C) 2003 JPO on STN

ACCESSION NUMBER: 2001-326209 JAPIO

TITLE: METHOD FOR TREATING SURFACE OF SILICON  
SUBSTRATE

INVENTOR: TAKADA RYOKO; TAKAISHI KAZUNARI

PATENT ASSIGNEE(S): MITSUBISHI MATERIALS SILICON CORP

PATENT INFORMATION:

PATENT NO	KIND	DATE	ERA	MAIN IPC
JP 2001326209	A	20011122	Heisei	H01L021-306

APPLICATION INFORMATION

STN FORMAT: JP 2000-142764 20000516

ORIGINAL: JP2000142764 Heisei

PRIORITY APPLN. INFO.: JP 2000-142764 20000516

SOURCE: PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined  
Applications, Vol. 2001

AN 2001-326209 JAPIO

AB PROBLEM TO BE SOLVED: To provide a method for treating surface of silicon **substrate** by which a **clean silicon substrate** can be obtained by well removing fine damages caused by working and organic matters, metallic impurities, and fine particles adhering to the surface of the **substrate** through a small number of steps and, in addition, the fraction non-defective after film formation can be improved.  
**SOLUTION:** This method includes a step 11 of dipping the silicon **substrate** in a mixed **solution of hydrogen peroxide and ammonium hydroxide**, etc., a step 12 of dipping the silicon **substrate** dipped in the mixed **solution** in at least one oxidizing liquid selected from among a dissolved ozone aqueous **solution**, nitric acid, and **hydrogen peroxide**, and a step 13 of dipping the silicon **substrate** dipped in the oxidizing liquid in a mixed **solution** of an organic acid or its salt and hydrofluoric acid. The method also includes a step 14 of dipping the silicon **substrate** dipped in the mixed **solution** in the step 13 in a liquid containing the organic acid or its salt and rinsing steps using extremely pure **water** among the steps 11, 12, 13 and 14.

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IC ICM H01L021-306

ICS H01L021-304

L87 ANSWER 3 OF 15 JAPIO (C) 2003 JPO on STN

ACCESSION NUMBER: 2001-284450 JAPIO

TITLE: MANUFACTURING METHOD FOR SEMICONDUCTOR DEVICE  
AND SEMICONDUCTOR DEVICE

INVENTOR: MORIMOTO NOBORU; MATSUURA MASAZUMI; GOTO KINYA

PATENT ASSIGNEE(S): MITSUBISHI ELECTRIC CORP

PATENT INFORMATION:

PATENT NO	KIND	DATE	ERA	MAIN IPC
JP 2001284450	A	20011012	Heisei	H01L021-768

APPLICATION INFORMATION

STN FORMAT: JP 2000-100483 20000403  
ORIGINAL: JP2000100483 Heisei  
PRIORITY APPLN. INFO.: JP 2000-100483 20000403  
SOURCE: PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined  
Applications, Vol. 2001

AN 2001-284450 JAPIO

AB PROBLEM TO BE SOLVED: To provide a method for manufacturing a semiconductor **device** which can avoid a short circuit between each electric wiring in an upper layer electric wiring, even when a part of top of a FSG film is exposed by dispersion of a manufacturing process.

**SOLUTION:** A method includes grinding to remove a USG film 4 by 900 nm thick from the top with a CMP method, after depositing the USG film 4 with 1  $\times$  m of film thickness all over a FSG film 3. At this time, a part of the top of the FSG film is exposed by dispersion of the manufacturing process. And next, the surface of an interlayer insulation film 50 is washed with a **cleaning solution** which has an etching rate for the FSG film 5 almost equal to an etching rate for the USG film 3. Such a **cleaning solution** includes, for example, ammonia hyperhydration of **NH<sub>4</sub>OH:H<sub>2</sub>O<sub>2</sub>**: **H<sub>2</sub>O=1:1:20**. The surface of the interlayer isolation film 50 is washed by means of immersing a structure shown in Figure 5 in the ammonia hyperhydration for 60 seconds.

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IC ICM H01L021-768

ICS H01L021-306; H01L021-316

L87 ANSWER 4 OF 15 JAPIO (C) 2003 JPO on STN

ACCESSION NUMBER: 2001-212968 JAPIO

TITLE: METHOD FOR **CLEANING CRYSTAL**

**SUBSTRATE USING CONDUCTIVE SOLUTION**

INVENTOR: RAGHAVAN NADIPURAM V VIJAYA; LEUNG ELAINE LAI-YEE

PATENT ASSIGNEE(S): AGILENT TECHNOL INC

PATENT INFORMATION:

PATENT NO	KIND	DATE	ERA	MAIN IPC
JP 2001212968	A	20010807	Heisei	B41J002-16

#### APPLICATION INFORMATION

STN FORMAT: JP 2000-348463 20001115  
ORIGINAL: JP2000348463 Heisei  
PRIORITY APPLN. INFO.: US 1999-441716 19991116  
SOURCE: PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined  
Applications, Vol. 2001

AN 2001-212968 JAPIO

AB PROBLEM TO BE SOLVED: To provide a method for efficiently **cleaning** crystal **substrates** which require a low defect density.

**SOLUTION:** This processing method for **cleaning** the crystal **substrate** (74) comprises a step (34) of applying a **solution** containing **water** and **ammonium hydroxide** to the crystal **substrate**, a step (36) of treating the crystal **substrate** with a **solution** containing **hydrogen peroxide** and a predetermined acid, a process (38) of rinsing the crystal **substrate** with **water** saturated with carbonate, a process (40) of applying a **solution** including **water** and **ammonium hydroxide** to the rinsed crystal **substrate**, and a process of rinsing the crystal **substrate** again with **water** saturated with carbonate.

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IC ICM B41J002-16  
ICS B08B003-08; G03F001-08

L87 ANSWER 5 OF 15 JAPIO (C) 2003 JPO on STN  
ACCESSION NUMBER: 2001-189297 JAPIO  
TITLE: METHOD AND **DEVICE** FOR **CLEANING**  
**WAFER**  
INVENTOR: SUZUKI TATSUYA  
PATENT ASSIGNEE(S): NEC CORP  
PATENT INFORMATION:

PATENT NO	KIND	DATE	ERA	MAIN IPC
JP 2001189297	A	20010710	Heisei	H01L021-304

## APPLICATION INFORMATION

STN FORMAT: JP 1999-372658 19991228  
ORIGINAL: JP11372658 Heisei  
PRIORITY APPLN. INFO.: JP 1999-372658 19991228  
SOURCE: PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined  
Applications, Vol. 2001

AN 2001-189297 JAPIO

AB PROBLEM TO BE SOLVED: To provide a method for **cleaning** a **wafer** suited to pre-processing or post-processing for micro machining semiconductor **device**, using a single-tank **wafer cleaning device**.

**SOLUTION:** This **cleaning** method is used to **clean** a **wafer** arranged vertically in a tank, by jetting a chemical **solution** and a **cleaning water** obliquely upward or obliquely downward. This method includes a step for dipping the **wafer** in the tank where the **cleaning water** is filled and streamed, a step for **cleaning** the **wafer** by supplying a first chemical **solution** that an ammonium, **hydrogen peroxide** and **water** are mixed at a volume ratio of **NH4OH:H2O2: water** = 1:1:X1 (where X1: >20 and <70) and using an upward stream, a step for applying a dip **cleaning**, a step to for supplying a second chemical **solution** that an ammonium, **hydrogen peroxide** and **water** are mixed at a volume ratio of 1:1:X2 (X2>X1) and has a **cleaning** performance and to substitute the first chemical **solution** with the second chemical **solution**, a step for applying QDR **cleaning**, and a step to supply a rinsing **water** and rinse the **water** by using the upward stream rinsing **water**.

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IC ICM H01L021-304

L87 ANSWER 6 OF 15 JAPIO (C) 2003 JPO on STN  
ACCESSION NUMBER: 2001-044155 JAPIO  
TITLE: BRUSHLESS MULTIPLE PATH **CLEANING** METHOD FOR **SILICON WAFER** AFTER CHEMICAL-MECHANICAL POLISHING USING IMMERSION  
INVENTOR: HACKENBERG DIANA  
PATENT ASSIGNEE(S): INTERSIL CORP  
PATENT INFORMATION:

PATENT NO	KIND	DATE	ERA	MAIN IPC
JP 2001044155	A	20010216	Heisei	H01L021-304

## APPLICATION INFORMATION

STN FORMAT: JP 2000-173059 20000609  
ORIGINAL: JP2000173059 Heisei  
PRIORITY APPLN. INFO.: US 1999-342948 19990629  
SOURCE: PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined  
Applications, Vol. 2001

AN 2001-044155 JAPIO

AB PROBLEM TO BE SOLVED: To reduce extra manufacturing cost and manufacturing time by immersing a **wafer** into a first megasonic chemical bath having a pH value equal to that of a substance to be removed and then **cleaning the wafer** with this megasonic bath.

**SOLUTION:** A silicon **wafer** is dipped into an interfacial active agent and thereafter it is then immersed into a megasonic bath including the **solution** consisting of ultra-pure **water, ammonium hydroxide and hydrogen peroxide** having the pH value equal to that of the substance to be removed for the first chemical megasonic sub-cycle. Immediately after the first chemical megasonic sub-cycle, the **wafer** is washed with the **cleaning water** using a megasonic unit for the first **water-cleaning** cycle. Moreover, with the same method, the stages of the second to fourth chemical megasonic cycles and second to sixth megasonic cycles are executed. Thereby, extra manufacturing cost and production time can be reduced.

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IC ICM H01L021-304

ICS B08B003-08; B08B003-12

L87 ANSWER 7 OF 15 JAPIO (C) 2003 JPO on STN

ACCESSION NUMBER: 2000-208469 JAPIO

TITLE: METHOD OF EVALUATING QUALITY OF SEMICONDUCTOR  
**WAFER**

INVENTOR: MIYAZAKI SUMIO; MIYAZAKI MORIMASA

PATENT ASSIGNEE(S): SUMITOMO METAL IND LTD

PATENT INFORMATION:

PATENT NO	KIND	DATE	ERA	MAIN IPC
JP 2000208469	A	20000728	Heisei	H01L021-304

## APPLICATION INFORMATION

STN FORMAT: JP 1999-9404 19990118  
ORIGINAL: JP11009404 Heisei  
PRIORITY APPLN. INFO.: JP 1999-9404 19990118  
SOURCE: PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined  
Applications, Vol. 2000

AN 2000-208469 JAPIO

AB PROBLEM TO BE SOLVED: To provide a method for evaluating the quality of a semiconductor **wafer** that can conveniently evaluate characteristics of a semiconductor **wafer** such as a breakdown voltage characteristic of an oxide film, etc.

**SOLUTION:** This method of evaluating the quality of a semiconductor **wafer** includes the steps of **cleaning** a semiconductor **wafer** surface a plurality of times by using a mixture **solution** of **NH4OH, H2O2** and **H2O** at a compounding ratio with a high etch selectivity against defects and surface roughness present near the semiconductor **wafer** surface, and evaluating the quality of the semiconductor **wafer** surface by measuring the distribution of light point defects(LPD) in the **wafer** surface by using a surface inspecting **device** using a high-intensity light source such as a laser, etc.

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IC ICM H01L021-304

ICS G01N021-88

L87 ANSWER 8 OF 15 JAPIO (C) 2003 JPO on STN

ACCESSION NUMBER: 2000-091291 JAPIO

TITLE: WASHING METHOD OF SILICON **WAFER**

INVENTOR: SATO MASANORI; SUZUKI YASUHIRO

PATENT ASSIGNEE(S): MEMC KK

PATENT INFORMATION:

PATENT NO	KIND	DATE	ERA	MAIN IPC
JP 2000091291	A	20000331	Heisei	H01L021-304

## APPLICATION INFORMATION

STN FORMAT: JP 1998-258548 19980911

ORIGINAL: JP10258548 Heisei

PRIORITY APPLN. INFO.: JP 1998-258548 19980911

SOURCE: PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined Applications, Vol. 2000

AN 2000-091291 JAPIO

AB PROBLEM TO BE SOLVED: To provide a washing method of a silicon **wafer** which can improve both oxide film breakdown strength characteristic and **cleanliness** of a silicon **wafer** surface at once.

**SOLUTION:** After a silicon **wafer** is washed by ozone-added ultra-pure **water** and a silicon **wafer** is washed by **NH4OH-H2O2** mixed **solution** of 30 to 70&deg;C, a silicon **wafer** is further washed by ozone-added ultra-pure **water** and a silicon **wafer** is washed by **NH4OH-H2O2-H2O** mixed **solution** of 40 to 80&deg;C. Both oxide film breakdown strength characteristic and **cleanliness** of a silicon **wafer** surface can be improved at once by combining ozone-added ultra-pure **water** washing which is excellent in decomposition/removal of organic compound and removal of transition metal impurities (especially, Cu) and washing by **NH4OH-H2O2-H2O** mixed **solution** which is excellent in washing effect.

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IC ICM H01L021-304

ICS B08B003-08

L87 ANSWER 9 OF 15 JAPIO (C) 2003 JPO on STN

ACCESSION NUMBER: 2000-049133 JAPIO

TITLE: METHOD OF **CLEANING** SEMICONDUCTOR **SUBSTRATE**

INVENTOR: TAKADA RYOKO; TAKAISHI KAZUNARI; YANAGI SHIGENARI

PATENT ASSIGNEE(S): MITSUBISHI MATERIALS SILICON CORP

PATENT INFORMATION:

PATENT NO	KIND	DATE	ERA	MAIN IPC
JP 2000049133	A	20000218	Heisei	H01L021-304

## APPLICATION INFORMATION

STN FORMAT: JP 1998-217148 19980731

ORIGINAL: JP10217148 Heisei

PRIORITY APPLN. INFO.: JP 1998-217148 19980731

SOURCE: PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined

## Applications, Vol. 2000

AN 2000-049133 JAPIO  
AB PROBLEM TO BE SOLVED: To remove microscopic damages caused by processing a semiconductor **substrate**, satisfactorily removing fine particles adhered to the surface of the semiconductor **substrate**, using the reduced number of processes and remove metallic impurity adhered to the surface of the semiconductor **substrate**.

**SOLUTION:** After impregnating a semiconductor **substrate** in a mixture of **hydrogen peroxide** and **ammonium hydroxide** and then in dissolved ozone **water**, the semiconductor **substrate** is impregnated in a liquid containing hydrofluoric acid at 0.005-0.25 weight%. After this, it is preferably soaked in oxidizing liquid. Organic acid or organic salt at 0.0001 weight% or more is further preferably added to hydrofluoric acid.

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IC ICM H01L021-304  
ICS B08B003-08; C11D007-08; C11D007-18; C11D007-60

L87 ANSWER 10 OF 15 JAPIO (C) 2003 JPO on STN

ACCESSION NUMBER: 2000-049132 JAPIO  
TITLE: METHOD OF **CLEANING SEMICONDUCTOR SUBSTRATE**

INVENTOR: TAKADA RYOKO; TAKAISHI KAZUNARI  
PATENT ASSIGNEE(S): MITSUBISHI MATERIALS SILICON CORP  
PATENT INFORMATION:

PATENT NO	KIND	DATE	ERA	MAIN IPC
JP 2000049132	A	20000218	Heisei	H01L021-304

## APPLICATION INFORMATION

STN FORMAT: JP 1998-217147 19980731  
ORIGINAL: JP10217147 Heisei  
PRIORITY APPLN. INFO.: JP 1998-217147 19980731  
SOURCE: PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined Applications, Vol. 2000

AN 2000-049132 JAPIO

AB PROBLEM TO BE SOLVED: To satisfactorily remove organic substances, metallic impurities and fine particles adhered to the surface of a semiconductor **substrate**, using the reduced number of processes and remove microscopic damages occurring due to processing the semiconductor **substrate**.

**SOLUTION:** After impregnating a semiconductor **substrate** in a mixture of hydrofluoric acid at 0.005-0.25 weight % and organic acid or organic salt at 0.0001 weight % or more, the semiconductor **substrate** is impregnated in rinsing **solution** containing organic acid or organic salt. Before impregnating it in the mixture, the semiconductor **substrate** is soaked in a mixture of **hydrogen peroxide** and **ammonium hydroxide** and is then preferably rinsed with ultrapure **water**. After impregnating it in the rinsing **water** containing organic acid or organic salt, it is preferably soaked in oxidizing liquid. In addition, hydrofluoric acid at 0.1 weight % or less may be added to the rinsing **water** containing organic acid or organic salt.

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IC ICM H01L021-304  
ICS B08B003-08; C11D007-08; C11D007-26; C11D007-60

L87 ANSWER 11 OF 15 JAPIO (C) 2003 JPO on STN



ACCESSION NUMBER: 2000-036479 JAPIO  
TITLE: PRODUCTION OF SEMICONDUCTOR **DEVICE**  
INVENTOR: HARA KOJI; TAKAHARA YOICHI; SAEKI TOMONORI; TOMIOKA  
HIDEKI; ITO MASAKI; TSUGANE MASARU; ITO HARUO;  
FUNAHASHI TOMOMASA  
PATENT ASSIGNEE(S): HITACHI LTD  
PATENT INFORMATION:

PATENT NO	KIND	DATE	ERA	MAIN IPC
JP 2000036479	A	20000202	Heisei	H01L021-304

## APPLICATION INFORMATION

STN FORMAT: JP 1998-202930 19980717  
ORIGINAL: JP10202930 Heisei  
PRIORITY APPLN. INFO.: JP 1998-202930 19980717  
SOURCE: PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined  
Applications, Vol. 2000

AN 2000-036479 JAPIO

AB PROBLEM TO BE SOLVED: To enhance reliability by employing a mixed liquid of a specified tertiary **ammonium hydroxide**, **hydrogen peroxide water** and ultrapure **water** in the **cleaning** after formation of a gate electrode using a high melting point metal nitride, i.e., tungsten nitride.

**SOLUTION:** A multiplayer conductor film including a high melting point metal nitride, i.e., tungsten nitride film, is formed on a semiconductor **substrate** and patterned into a desired shape before being **cleaned**. A mixed liquid of a tertiary **ammonium hydroxide**, **hydrogen peroxide water** and ultrapure **water** represented by a formula  $[I(R1)nN(R)4-n+OH-]$  (R1 is alkyl group of 1-4C, R is alkyl group of 1-4C or hydroxy substituted alkyl group of 1-4C, R1 and R may be identical or not, and n is an integer of 1-3)}. According to the method, the tungsten nitride film can be protected against being etched at the time of **cleaning**.

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IC ICM H01L021-304  
ICS H01L021-28; H01L029-78

L87 ANSWER 12 OF 15 JAPIO (C) 2003 JPO on STN

ACCESSION NUMBER: 1999-274129 JAPIO  
TITLE: **CLEANING OF SEMICONDUCTOR SUBSTRATE**  
INVENTOR: TAKADA RYOKO; FUJIMOTO MARUHISA; TAKAISHI KAZUNARI  
PATENT ASSIGNEE(S): MITSUBISHI MATERIALS SILICON CORP  
PATENT INFORMATION:

PATENT NO	KIND	DATE	ERA	MAIN IPC
JP 11274129	A	19991008	Heisei	H01L021-304

## APPLICATION INFORMATION

STN FORMAT: JP 1998-77257 19980325  
ORIGINAL: JP10077257 Heisei  
PRIORITY APPLN. INFO.: JP 1998-77257 19980325  
SOURCE: PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined  
Applications, Vol. 1999

AN 1999-274129 JAPIO

AB PROBLEM TO BE SOLVED: To remove fine damages caused by the processing of a semiconductor **substrate** and to properly remove organic matter,

metallic impurities and fine particles deposited on the semiconductor **substrate** in few number of steps.

**SOLUTION:** A semiconductor **substrate** is **cleaned** with use of a mixture solution of **hydrogen peroxide** and **ammonium hydroxide** and then rinsed with ultra-pure **water**. The rinsed **substrate** is **cleaned** with the use of a **cleaning solution** containing 0.0001 weight % or more of organic acid or organic acid chloride. The **substrate** is further **cleaned** with an oxidizing **solution**. Preferably, the **cleaning solution** is added in the organic acid or organic acid chloride and 0.005-0.25 weight % of hydrofluoric acid is further included.

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IC ICM H01L021-304

L87 ANSWER 13 OF 15 JAPIO (C) 2003 JPO on STN

ACCESSION NUMBER: 1997-270412 JAPIO

TITLE: **CLEANING DEVICE AND METHOD**

INVENTOR: MIYAWAKI MAMORU

PATENT ASSIGNEE(S): CANON INC

PATENT INFORMATION:

PATENT NO	KIND	DATE	ERA	MAIN IPC
JP 09270412	A	19971014	Heisei	H01L021-304

APPLICATION INFORMATION

STN FORMAT: JP 1996-79041 19960401

ORIGINAL: JP08079041 Heisei

PRIORITY APPLN. INFO.: JP 1996-79041 19960401

SOURCE: PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined Applications, Vol. 1997

AN 1997-270412 JAPIO

AB PROBLEM TO BE SOLVED: To remove flowing materials by suction so as to prevent foreign objects from adhering around the edge of a **substrate** and being left even after **cleaning** by a method wherein a suction opening is provided around the contacting part of a **substrate** holding member with the side of the **substrate**.

**SOLUTION:** A vacuum pump connected to an exhaust vent and a drainage opening is actuated to reduce a **cleaning** tank in pressure, and then nitrogen gas is introduced into the **cleaning** tank through a nozzle 6. Ultra-pure **water** loaded with 2 to 10ppm of ozone is made to drop down on the surface of a **wafer** 3 through a chemical nozzle 2 keeping the **wafer** 3 rotating at a speed of 1500 to 3000rpm. In succession, mixed liquid composed of **ammonium hydroxide**, **hydrogen peroxide** aqueous **solution**, and ultra-pure **water** mixed at the ratio 2:1:5 and another mixed liquid composed of hydrofluoric acid and ultra-pure **water** mixed at the ratio 0.01:1 are successively made to drop down on the surface of the **wafer** 3, and lastly mixed liquid composed of isopropyl alcohol and ultra-pure **water** mixed at the ratio 1:5 is made to drop down. Then, the mixed liquid is stopped, and nitrogen gas is blown against the surface of the **wafer** 3 to dry it out.

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IC ICM H01L021-304

ICS H01L021-304; H01L021-68

L87 ANSWER 14 OF 15 JAPIO (C) 2003 JPO on STN

ACCESSION NUMBER: 1992-107923 JAPIO

TITLE: **CLEANING METHOD FOR SEMICONDUCTOR  
SUBSTRATE**  
INVENTOR: SHIROMIZU YOSHIMI  
PATENT ASSIGNEE(S): FUJITSU LTD  
PATENT INFORMATION:

PATENT NO	KIND	DATE	ERA	MAIN IPC
JP 04107923	A	19920409	Heisei	H01L021-304

## APPLICATION INFORMATION

STN FORMAT: JP 1990-227126 19900829  
ORIGINAL: JP02227126 Heisei  
PRIORITY APPLN. INFO.: JP 1990-227126 19900829  
SOURCE: PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined  
Applications, Vol. 1992

AN 1992-107923 JAPIO

AB PURPOSE: To keep **cleaning** condition constant and reduce the metallic impurity pollution at the semiconductor **substrate** face by soaking a semiconductor **substrate** in the **cleaning** liquid, which is diluted with **water** within the range of not losing the **cleaning** effect and consists of the mixed liquid of **ammonium hydroxides, hydrogen peroxides, and water** and is heated in the condition that it is shut off by inert gas, and then applying ultrasonics to it so as to produce new **hydrogen peroxides** in the **cleaning** liquid, and then stopping only the ultrasonics, and **cleaning** it in this **cleaning** liquid.

CONSTITUTION: The **cleaning** liquid, which is diluted in, for example, [30%**H<SB>4</SB>OH solution: 30%**H<SB>2</SB>O<SB>2</SB>: H<SB>2</SB>O:1:1:1000**] by wt. ratio, is used and it is heated at a constant temperature of about 60-80deg;C in the condition that the surface is shut off from the air, and in this **cleaning** liquid, a semiconductor **substrate** is soaked, and then as in the condition that the semiconductor **substrate** is soaked, ultrasonics are applied to produce **H<SB>2</SB>O<SB>2</SB>**, and the concentration of **H<SB>2</SB>O<SB>2</SB>** is restored to the concentration approximately equal to the initial concentration. Next, only the ultrasonics are stopped, and the semiconductor **substrate** is kept in the regenerated **cleaning** liquid successively.**

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IC ICM H01L021-304

L87 ANSWER 15 OF 15 JAPIO (C) 2003 JPO on STN

ACCESSION NUMBER: 1992-000719 JAPIO  
TITLE: METHOD AND APPARATUS FOR **CLEANING** TREATMENT  
INVENTOR: SAKURAI TOSHIHIKO; HARAZONO MASAOKI  
PATENT ASSIGNEE(S): HITACHI LTD  
PATENT INFORMATION:

PATENT NO	KIND	DATE	ERA	MAIN IPC
JP 04000719	A	19920106	Heisei	H01L021-304

## APPLICATION INFORMATION

STN FORMAT: JP 1990-102157 19900418  
ORIGINAL: JP02102157 Heisei  
PRIORITY APPLN. INFO.: JP 1990-102157 19900418  
SOURCE: PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined  
Applications, Vol. 1992

AN 1992-000719 JAPIO

AB PURPOSE: To increase the **cleaning**-treatment number of objects to be treated by executing the following: a first **cleaning** treatment by which the objects to be treated are immersed in a mixed **solution** of **hydrogen peroxide** and pure **water**; and a second **cleaning** treatment by which the objects to be treated are immersed in a mixed **solution** of **hydrogen peroxide** and **ammonium hydroxide**.

CONSTITUTION: A **wafer** 2 is conveyed to a **cleaning** tank 4b by using a conveyance arm 6; it is immersed in a mixed **solution** of H<SB>2</SB>O<SB>2</SB> and pure **water** which has been introduced into the **cleaning** tank 4b as a chemical liquid. In the **cleaning** tank 4b, organic substances 13 which have adhered to the **wafer** 2 are oxidized by H<SB>2</SB>O<SB>2</SB> in the chemical liquid. Then, the **wafer** 2 is conveyed to a **cleaning** tank 4c by using the conveyance arm 6; it is immersed in a mixed **solution** of H<SB>2</SB>O<SB>2</SB>, NH<SB>4</SB>OH and pure **water** which has been introduced into the **cleaning** tank 4c as a chemical liquid. In the **cleaning** tank 4c, the organic substances 13 which have been oxidized at the first **cleaning** treatment are removed by H<SB>2</SB>O<SB>2</SB> and NH<SB>4</SB>OH inside the **cleaning** tank 4c. Consequently, when the treatment temperature inside the **cleaning** tank 4c is set to be high, the removal speed of the organic substances 13 is increased and the removal treatment time of the organic substances 13 inside the **cleaning** tank 4c can be shortened.

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IC ICM H01L021-304

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<http://thomsonderwent.com/coverage/latestupdates/> <<<

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<http://thomsonderwent.com/support/userguides/> <<<

=> d L89 1-8 all

L89 ANSWER 1 OF 8 WPIX COPYRIGHT 2003 THOMSON DERWENT on STN  
AN 2003-079189 [08] WPIX  
DNN N2003-061630 DNC C2003-020989  
TI **Cleaning** liquid for electronic component, contains hydrogen  
fluoride and **surfactant**.  
DC L03 U11  
PA (OMIT-I) OMI T; (ULTR-N) ULTRACLEAN TECHNOLOGY KAIHATSU KENKYUSHO  
CYC 1  
PI JP 2002261069 A 20020913 (200308)\* 9p H01L021-304  
ADT JP 2002261069 A JP 2001-55364 20010228  
PRAI JP 2001-55364 20010228  
IC ICM H01L021-304

ICS C11D003-04; C11D003-395; C11D007-04; C11D010-02; C11D017-08  
AB JP2002261069 A UPAB: 20030204  
NOVELTY - A **cleaning** liquid contains 0.05-0.5 weight% of  
hydrogen fluoride and a **surfactant**.

DETAILED DESCRIPTION - An INDEPENDENT CLAIM is included for  
**cleaning** of electronic component. The concentration of ozone in  
the electronic component after washing with ozone **water** is 1  
mg/l or more. The electronic component is then **cleaned** using  
**cleaning** liquid containing hydrogen fluoride and  
**surfactant**.

USE - For removing contaminants such as metal, organic substance and  
microparticle, on semiconductor **substrate** of electronic  
component.

ADVANTAGE - The contaminants on semiconductor **substrate**  
surface are removed effectively without damaging the fine structures on  
the **substrate**. The process is performed stably in a short time  
at room temperature. Curtailment and miniaturization of washing apparatus  
are attained. The cost of electronic component is lowered.

DESCRIPTION OF DRAWING(S) - The graph shows characteristic view of  
temperature dependency of particulate-removal effect of **cleaning**  
liquid containing **ammonium hydroxide**, **hydrogen**  
**peroxide** and **water**. (Drawing includes non-English  
language text).

Dwg.1/10

FS CPI EPI  
FA AB; GI  
MC CPI: L04-C09  
EPI: U11-A10; U11-C06A1B

L89 ANSWER 2 OF 8 WPIX COPYRIGHT 2003 THOMSON DERWENT on STN  
AN 2002-740773 [80] WPIX  
DNN N2002-583640 DNC C2002-209749  
TI Method of permanently waving hair involves wrapping dry hair onto several  
wrapping **devices**, applying waving lotion to dry hair and  
processing treated hair to obtain permanently waved hair.  
DC A96 A97 D21 E19 P24  
IN RATHNAM, J  
PA (RATH-I) RATHNAM J  
CYC 100  
PI WO 2002071890 A1 20020919 (200280)\* EN 52p A45D007-06  
RW: AT BE CH CY DE DK EA ES FI FR GB GH GM GR IE IT KE LS LU MC MW MZ  
NL OA PT SD SE SL SZ TR TZ UG ZM ZW  
W: AE AG AL AM AT AU AZ BA BB BG BR BY BZ CA CH CN CO CR CU CZ DE DK  
DM DZ EC EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR  
KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX MZ NO NZ OM PH PL PT  
RO RU SD SE SG SI SK SL TJ TM TN TR TT TZ UA UG UZ VN YU ZA ZM ZW

US 2003024542 A1 20030206 (200313) A45D007-04  
US 6557562 B2 20030506 (200338) A45D024-00  
ADT WO 2002071890 A1 WO 2002-US6630 20020305; US 2003024542 A1 US 2001-802339  
20010309; US 6557562 B2 US 2001-802339 20010309  
PRAI US 2001-802339 20010309  
IC ICM A45D007-04; A45D007-06; A45D024-00  
ICS A61K007-06; A61K007-13  
AB WO 200271890 A UPAB: 20021212  
NOVELTY - A method of permanently waving hair, involves wrapping dry hair  
onto several wrapping **devices**, applying a waving lotion to the  
dry hair and processing the treated hair to obtain permanently waved hair.  
DETAILED DESCRIPTION - An INDEPENDENT CLAIM is included for  
straightening hair which involves applying a waving lotion to dry hair and  
applying tension to the hair having the applied waving lotion to obtain  
straightened hair.  
USE - For permanently perming or straightening hair.  
ADVANTAGE - The method enables permanent waving of hair in a short  
processing time using very low concentrations of treatment chemicals.  
Desired perms are achieved in a safe way for environment, perm clients,  
hair dressers and manufacturers. The method maximizes the benefits by  
virtually removing or minimizing problems of perming such as delayed  
penetrations, dilution and spilling of waving lotion. The lotion used is  
ultra mild, least spilling, processed at room temperature for very short  
period, contact time with the scalp is short and is safe. The cost of  
active raw materials used in the ultra mild perm formulations is reduced  
about 50-75% compared to high strength perm formulation.  
Dwg.0/0  
FS CPI GMPI  
FA AB; DCN  
MC CPI: A12-V04A; D08-A; D08-B05; E10-B02D1; E10-B04E; E10-B04E1; E10-C04D2;  
E10-E03K; E32-A02; E32-A04; E33-A03; E33-C  
  
L89 ANSWER 3 OF 8 WPIX COPYRIGHT 2003 THOMSON DERWENT on STN  
AN 2002-426448 [45] WPIX  
CR 2000-062516 [05]  
DNN N2002-335323 DNC C2002-120920  
TI Stabilized alkaline composition for stripping or **cleaning**  
**integrated circuit substrates** includes metal  
ion-free base and bath stabilizing agent.  
DC D25 E19 L03 P43 P84 Q73 U11  
IN SKEE, D C  
PA (MLCW) MALLINCKRODT BAKER INC; (SKEE-I) SKEE D C; (MLCW) MALLINCKRODT INC  
CYC 95  
PI WO 2002033033 A1 20020425 (200245)\* EN 68p C11D003-00  
RW: AT BE CH CY DE DK EA ES FI FR GB GH GM GR IE IT KE LS LU MC MW MZ  
NL OA PT SD SE SL SZ TR TZ UG ZW  
W: AE AG AL AM AT AU AZ BA BB BG BR BY BZ CA CH CN CR CU CZ DE DK DM  
DZ EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC  
LK LR LS LT LU LV MA MD MG MK MN MW MX MZ NO NZ PL PT RO RU SD SE  
SG SI SK SL TJ TM TR TT TZ UA UG US UZ VN YU ZA ZW  
US 2002077259 A1 20020620 (200247) B08B007-00  
AU 2001096947 A 20020429 (200255) C11D003-00  
EP 1326951 A1 20030716 (200347) EN C11D003-00  
R: AL AT BE CH CY DE DK ES FI FR GB GR IE IT LI LT LU LV MC MK NL PT  
RO SE SI TR  
US 6599370 B2 20030729 (200354) C23G001-02  
ADT WO 2002033033 A1 WO 2001-US42406 20010928; US 2002077259 A1 CIP of US  
2000-688559 20001016, US 2001-859142 20010516; AU 2001096947 A AU  
2001-96947 20010928; EP 1326951 A1 EP 2001-977863 20010928, WO  
2001-US42406 20010928; US 6599370 B2 CIP of US 2000-688559 20001016, US

2001-859142 20010516

FDT AU 2001096947 A Based on WO 2002033033; EP 1326951 A1 Based on WO 2002033033

PRAI US 2001-859142 20010516; US 2000-688559 20001016

IC ICM B08B007-00; C11D003-00; C23G001-02

ICS B08B003-00; B08B003-10; B08B003-14; C03C023-00; C11D007-26;  
C11D007-32; C23G001-00; F23J001-00; G03F007-42

AB WO 200233033 A UPAB: 20030821

NOVELTY - A stabilized alkaline composition comprises:

(a) metal ion-free base(s);

(b) bath stabilizing agent(s) of pKa 10-13; and

(c) **water**.

DETAILED DESCRIPTION - An INDEPENDENT CLAIM is also included for a method of **cleaning** semiconductor **wafer**

**substrates** by contacting the **substrate** surface with the composition for a time and at a temperature to **clean** unwanted contaminants and residues from the surface.

USE - For stripping or **cleaning integrated circuit substrates** in the microelectronics industry.

ADVANTAGE - The composition removes metallic and organic contaminants from the semiconductor **wafer substrates** without damaging the **integrated circuits**, and avoids the expense and adverse consequences caused by intermediate rinses. It has a very long effective bath life.

Dwg.0/0

FS CPI EPI GMPI

FA AB; DCN

MC CPI: D11-A01B1; D11-A02B; D11-A02B2;

D11-B01B; E07-D04C; E07-D04D; E10-A18B; E10-A22E; E10-A22G;

E10-B01E; L04-C09

EPI: U11-C04A1

L89 ANSWER 4 OF 8 WPIX COPYRIGHT 2003 THOMSON DERWENT on STN

AN 2001-610387 [70] WPIX

DNN N2001-455588 DNC C2001-182224

TI Semiconductor **wafer cleaning** involves applying aqueous solution containing **ammonium hydroxide** on **wafer** having exposed metal region and simultaneously applying ultrasonic energy to solution.

DC L03 P43 U11

IN GULDI, R L; RITCHISON, J W

PA (TEXI) TEXAS INSTR INC

CYC 1

PI US 6267122 B1 20010731 (200170)\* 8p B08B003-12

ADT US 6267122 B1, US 1993-119785 19930910

PRAI US 1993-119785 19930910

IC ICM B08B003-12

AB US 6267122 B UPAB: 20011129

NOVELTY - A solution containing **water** and **ammonium hydroxide** is applied to a **wafer** having exposed metal regions. Simultaneously, ultrasonic energy is applied to the solution and the **wafer** is **cleaned**.

DETAILED DESCRIPTION - A **surfactant** is added to the solution containing **ammonium hydroxide** and **water** in a ratio of 0.001-0.2. The solution is maintained at a temperature of 25-90 deg. C. After applying the solution, the **wafer** is rinsed with **water**.

USE - For **cleaning** silicon semiconductor **wafers** during electronic **device** fabrication.

ADVANTAGE - The application of ultrasonic energy to the solution

enhances the **wafer cleaning** efficiency. The particulate is efficiently removed from the **wafer** without using **hydrogen peroxide** that damages titanium nitride layer. The method utilizes wide range of concentrations, treatment times and bath temperatures based on particular demands including solution lifetime and cost.

Dwg.0/9

FS CPI EPI GMPI

FA AB

MC CPI: L04-C09

EPI: U11-A10; U11-C06A1B

L89 ANSWER 5 OF 8 WPIX COPYRIGHT 2003 THOMSON DERWENT on STN

AN 1999-256612 [22] WPIX

DNN N1999-191203 DNC C1999-075277

TI Polishing method for metal film, especially in semiconductor interconnection process.

DC A14 A32 A35 A85 G02 L03 P61 U11

IN HINODE, K; HOMMA, Y; KONDO, S; SAKUMA, N; TAKEDA, K

PA (HITA) HITACHI LTD

CYC 31

PI EP 913442 A2 19990506 (199922)\* EN 42p C09G001-02

R: AL AT BE CH CY DE DK ES FI FR GB GR IE IT LI LT LU LV MC MK NL PT

RO SE SI

JP 11135466 A 19990521 (199931) 19p H01L021-304

CN 1216727 A 19990519 (199938) B24B037-00

KR 99037374 A 19990525 (200032) H01L021-302

US 6117775 A 20000912 (200046) H01L021-302

TW 380083 A 20000121 (200047) B24B007-20

JP 2001298009 A 20011026 (200203) 19p H01L021-304

JP 3371775 B2 20030127 (200315) 19p H01L021-304

SG 95588 A1 20030423 (200337) H01L021-306

US 6117775 C1 20030715 (200354) H01L021-302

US 6596638 B1 20030722 (200354) H01L021-302

ADT EP 913442 A2 EP 1998-308923 19981030; JP 11135466 A JP 1997-299937

19971031; CN 1216727 A CN 1998-123672 19981030; KR 99037374 A KR

1998-44809 19981026; US 6117775 A US 1998-182438 19981030; TW 380083 A TW

1998-116346 19981001; JP 2001298009 A Div ex JP 1997-299937 19971031, JP

2001-77422 19971031; JP 3371775 B2 JP 1997-299937 19971031; SG 95588 A1 SG

1998-4195 19981013; US 6117775 C1 US 1998-182438 19981030; US 6596638 B1

Cont of US 1998-182438 19981030, US 2000-618999 20000718

FDT JP 3371775 B2 Previous Publ. JP 11135466; US 6596638 B1 Cont of US 6117775

PRAI JP 1997-299937 19971031; JP 2001-77422 19971031

IC ICM B24B007-20; B24B037-00; C09G001-02; H01L021-302; H01L021-304;

H01L021-306

ICS C09K003-14

ICA B24B037-04

AB EP 913442 A UPAB: 19990609

NOVELTY - The polishing method for removing at least part of a metal film, involves mechanically rubbing a metal film surface using a polishing solution comprising less than 1 wt % of a polishing abrasive. The solution has a pH and oxidation-reduction potential in the domain of corrosion of the metal film. The polishing abrasive may also have an oxidizer and a substance which renders an oxide **water-soluble**.

DETAILED DESCRIPTION - INDEPENDENT CLAIMS are also included for a method of manufacturing a semiconductor **device** by forming an insulating film, having an opening exposing an impurity-doped layer, interconnection layer or conducting layer on a **substrate**, forming a metal film, removing the metal film by the above method, **cleaning** and drying



USE - Polishing a metal film in a semiconductor **device** interconnection process.

ADVANTAGE - Reduced scratches on the metal film surface, dishing and erosion are suppressed, peeling is reduced, the cost of the polishing solution and polishing pad are reduced, throughput is increased, and dust production is suppressed.

DESCRIPTION OF DRAWING(S) - The figure shows the chemical mechanical polishing machine used to implement the method.

Dwg.1/26

FS CPI EPI GMPI

FA AB; GI

MC CPI: A11-B05; A11-C; A12-E04; A12-E07C; G02-C; L04-B04  
EPI: U11-A10; U11-C06A1A; U11-C07C2

L89 ANSWER 6 OF 8 WPIX COPYRIGHT 2003 THOMSON DERWENT on STN

AN 1997-289504 [26] WPIX

DNN N1997-239721 DNC C1997-093195

TI Production of **wafer-cleaning** solutions used for washing semiconductors - by mixing hydro fluoric acid, hydrogen per oxide, nitric acid, alkyl **ammonium hydroxide**, **surfactants** and **water**.

DC A97 D25 E19 L03 U11

IN ITANO, M; KAMIYA, F; KEZUKA, T; SUYAMA, M

PA (DAIK) DAIKIN IND LTD; (DAIK) DAIKIN KOGYO KK

CYC 22

PI WO 9718582 A1 19970522 (199726)\* JA 21p H01L021-304

RW: AT BE CH DE DK ES FI FR GB GR IE IT LU MC NL PT SE

W: CN JP KR US

EP 871209 A1 19981014 (199845) EN H01L021-304

R: DE FR GB IT

JP 09518733 X 19990126 (199914) H01L021-304

CN 1202274 A 19981216 (199918) H01L021-304

US 6068788 A 20000530 (200033) C09K013-04

KR 99063592 A 19990726 (200043) H01L021-304

TW 387944 A 20000421 (200061) C23F001-16

US 6159865 A 20001212 (200067)# H01L021-302

KR 269013 B1 20001101 (200139) H01L000-00

ADT WO 9718582 A1 WO 1996-JP3313 19961111; EP 871209 A1 EP 1996-937559 19961111, WO 1996-JP3313 19961111; JP 09518733 X WO 1996-JP3313 19961111, JP 1997-518733 19961111; CN 1202274 A CN 1996-198370 19961111; US 6068788 A WO 1996-JP3313 19961111, US 1998-51492 19980422; KR 99063592 A WO 1996-JP3313 19961111, KR 1998-702035 19980319; TW 387944 A TW 1996-115661 19961219; US 6159865 A Div ex US 1998-51492 19980422, US 2000-523216 20000310; KR 269013 B1 WO 1996-JP3313 19961111, KR 1998-702035 19980319

FDT EP 871209 A1 Based on WO 9718582; JP 09518733 X Based on WO 9718582; US 6068788 A Based on WO 9718582; KR 99063592 A Based on WO 9718582; US 6159865 A Div ex US 6068788

PRAI JP 1995-322292 19951115; JP 1995-322291 19951115; US 2000-523216 20000310

REP JP 641770; JP 684866; JP 745600

IC ICM C09K013-04; C23F001-16; H01L000-00; H01L021-302; H01L021-304

ICS C09K013-00; C09K013-06; C09K013-08; C11D001-12; C11D003-04;

C11D017-08; H01L021-308

AB WO 9718582 A UPAB: 19970626

A **wafer-cleaning** solution comprises 20-60 wt.% hydrofluoric acid (HF) with 0.1-1000 ppm CnH2n+1ph(SO3M)Oph(SO3M) (where, ph = phenylene, n = 5-20, M = H or salt), CnH2n+1phO(CH2CH2O)mSO3M (where, m = 0-20) and CnH2n+1O(CH2CH2O)mSO3M, and the balance of **water**.

Also claimed is a processes for producing the **wafer-cleaning** solution by diluting the above **cleaning**

solution with **water** to contain 0.1-5 wt.% HF and 0.01-100 ppm of the above **surfactant(s)**. This is carried by adding **water** and **hydrogen peroxide (H2O2)** to the **cleaning** solution to contain 0.1-10 wt.% HF, 0.01-30 wt.% **H2O2** and 0.01-100 ppm of the above **surfactant(s)**. Next, **water** and nitric acid (HNO3) are added to the above **cleaning** solution so it contains 0.1-50 wt.% HF, 0.1-70 wt.% HNO3 and 0.01-100 ppm of the **surfactant(s)**. **Water** and ammonium fluoride (NH4F) are then added to the **cleaning** solution so it contains 0.1-10 wt.% HF, 1-40 wt.% NH4F and 0.01-100 ppm of the **surfactant(s)**. Further claimed are several other solutions.

USE - The **wafer-cleaning** solutions are used prevent contamination due to adhered microparticles and other foreign bodies on silicon or thermal-acidified membrane **wafer**, semiconductor elements and the like.

ADVANTAGE - The **wafer-cleaning** solutions have excellent solubility, storability and transportability, without foaming.

Dwg.0/0

FS CPI EPI

FA AB; DCN

MC CPI: A12-E07A; A12-W12B; D11-A01A; D11-A01B1;  
D11-A01B2; D11-A03A; E10-A09A; E10-A09B4; E10-A22E;  
E10-A22G; E31-B03C; E31-E; E31-H05; E32-A04; L04-C09  
EPI: U11-C06A1B

L89 ANSWER 7 OF 8 WPIX COPYRIGHT 2003 THOMSON DERWENT on STN

AN 1990-380242 [51] WPIX

DNN N1990-289717 DNC C1990-165687

TI Wet **cleaning** process for semiconductor **substrate** -  
comprises treatment with hydrofluoric acid **cleaning** with e.g.  
choline, rinsing and drying.

DC A85 L03 P43 U11

IN TANAKA, M

PA (DNIS) DAINIPPON SCREEN SEIZO KK; (DNIS) DAINIPPON SCREEN MFG CO LTD  
CYC 3

PI JP 02275631 A 19901109 (199051)\*

US 5129955 A 19920714 (199231) 13p B08B003-08

KR 9301287 B1 19930225 (199417) H01L021-302

ADT JP 02275631 A JP 1989-120172 19890512; US 5129955 A US 1990-462014  
19900108; KR 9301287 B1 KR 1990-116 19900108

PRAI JP 1989-5096 19890111; JP 1989-120172 19890512

IC ICM B08B003-08; H01L021-302

ICS C23G001-02; H01L021-30

AB JP 02275631 A UPAB: 19930928

Process comprises (a) treating the **substrate** with a surface  
treating agent contg. HF; (b) **cleaning** the surface of the  
**substrate**; (c) rinsing the **substrate** in pure  
**water**, removing liq. and drying. The **cleaner** contains  
silicone and/or its deriv. and surface of the **substrate** is  
**cleaned** after being rendered hydrophilic.

Appts. to carry out the process is also claimed.

USE/ADVANTAGE - The process is applied to semiconductor  
**device** with no generation of oxide film on it, effective removal  
of colloidal particles and without re-adhesion of F on the **wafer**

In an example, a **cleaning** appts. is set in advance of  
photoresist coating process. A **wafer** is **cleaned** by 5%  
HF soln. to removing SiO film on it, **cleaned** with a choline  
**cleaning** soln., rinsed in pure **water**. Surface of the  
**wafer** is slightly etched by pure **water** contg. silicone

and F ion or inorganic ion combines with choline cation to form colloidal particles, and covered with OH(-) to make it hydrophilic. The colloidal particles are removed by centrifugal force with the **cleaner**, and **substrate** is dried. As a result, the number of particles remaining is 44 by choline **cleaning** but 111 particles by **surfactant cleaning** and 1105 particles by **H2O2 cleaning**.

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FS CPI EPI GMPI

FA AB

MC CPI: A06-A00E2; A12-E07C; A12-W12B; L04-C09

EPI: U11-C04A1

L89 ANSWER 8 OF 8 WPIX COPYRIGHT 2003 THOMSON DERWENT on STN

AN 1986-121928 [19] WPIX

DNN N1986-089955 DNC C1986-051967

TI Liq. **detergent** compsn. for **cleaning** e.g. silicon **wafers** - contains **water**, **ammonium hydroxide**, **hydrogen peroxide** and **ammonium cpd.**

DC D25 E35 E36 U11

PA (TOKE) TOSHIBA KK

CYC 1

PI JP 61060799 A 19860328 (198619)\* 4p

JP 63014038 B 19880329 (198816)

ADT JP 61060799 A JP 1984-181844 19840831

PRAI JP 1984-181844 19840831

IC C11D007-18; H01L021-30

AB JP 61060799 A UPAB: 19930922

Compsn. comprises (A) **water** (1000 ml), (B) at least 2.5 mol of **NH4OH**, (C) 0.9-3.8 mol of **H2O2** and (D) 0.1-2.5 mol of at least one ammonia salt selected from phosphate, citrate, acetate, silicate or other inorganic salt and opt. (E) 2-50 g of **surfactant**.

Aq. ammonia and aq. **H2O2** sterilise and remove bacteria and organic fouling and **H2O2** oxidises trace of impurity metals. The aq. ammonia attacks the surface layer of glass **substrate** to remove adsorbed fouling together with the thin surface layer to improve the wettability of surface of **substrate**. The aq. ammonia turns the **detergent** soln. to alkaline pH to prevent the destruction of insulating material and acts as buffer to stabilise the **detergent** soln. The inorganic cation and **surfactant** retain selectively in the form of electric double layer to protect the surface of metal. The washing power is enhanced by applying ultrasonic wave and heating at 70-85 deg.C.

USE/ADVANTAGE - The **detergent** compsn. does not attack amphoteric elements such as Al and various metal and adheres no scum after the washing. It is suitable for **cleaning substrate** board such as silicon **wafer** before the formation of film.

0/0

FS CPI EPI

FA AB

MC CPI: D11-A; D11-B14; D11-B20;

D11-B22; D11-D07; E05-S; E10-C02A; E10-C04J; E31-E;

E31-K05E; E31-P05D; E32-A04

EPI: U11-C07